St. Louis Metro Area Rail Gateway Enterprise

DRAFT ENVIRONMENTAL IMPACT STATEMENT
Volume I - Text

U.S. Department of Transportation

Illinois Department of Transportation

THE ST. LOUIS METRO AREA RAIL GATEWAY ENTERPRISE EXTENDING FROM THE DUPO RAIL BYPASS IN ST. CLAIR COUNTY, NORTH TO THE LENOX RAIL TOWER IN MADISON COUNTY AND EAST TO THE ALTON AND SOUTHERN RAIL CORRIDOR PARALLELING THE MISSISSIPPI RIVER BLUFFS IN ILLINOIS.

ADMINISTRATION ACTION
DRAFT
ENVIRONMENTAL IMPACT STATEMENT
and 4(f) DISCUSSION
U.S. DEPARTMENT OF TRANSPORTATION
Federal Railroad Administration

Submitted pursuant to Section 102 (2)(c) of the National Environmental Policy Act, 42 USC 4332(2)(c), 16 USC 470 (f) and 49 USC 1653 (f)

Cooperating Agencies:

Federal Highway Administration
Interstate Commerce Commission
United States Coast Guard

JUL 29 1981 — Date

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FOREWORD

BACKGROUND

This Environmental Impact Statement (EIS) addresses the St. Louis Metro Area Gateway Enterprise (MARGE) project. The St. Louis MARGE Project is a joint effort by the Federal Railroad Administration (FRA), the Illinois Department of Transportation (IDOT), local communities, and the railroads serving the St. Louis area to seek solutions to rail operational problems, rail/community conflicts, and constraints which inhibit economic and community development.

The current effort to provide a solution for the above problems had its origin in a study initiated by a request from the Region's A-95 planning agency, the East-West Gateway Coordinating Council, to the FRA in 1971. The result of that study was a recommendation to consolidate most rail switching activity into a single large yard. The recommended facility was twice as large (measured in either length or cars handled) as any facility in the United States, and involved the application of unproven operating strategies and technologies. As a consequence, the plan was rejected by the 17 railroads operating in the region as infeasible.

With this rejection, the railroads recognized a need to provide a workable alternative to the study recommendation. Hence, they became actively involved in the search for solutions to the problems of the Gateway. This involvement led to a three-phase process, entitled the St. Louis Metro Area Rail Gateway Enterprise, begun by the FRA in 1976. The purpose of each Phase was defined as follows:

- Phase I: to identify feasible alternatives for restructuring the rail gateway terminal
- Phase II: to refine those alternatives and analyze their environmental impacts
- Phase III: to design and construct the terminal facilities.

PHASE I

For this initial phase, FRA brought the railroads together utilizing an innovative organizational structure, the Railroad Technical Advisory Committee (RTAC). This committee is comprised of representatives of all 17 railroad companies. A Railroad Steering Committee (RSC), consisting of railroad executive officers, was also established to oversee the work of the RTAC and the consultants to the MARGE Project, and to review and approve operating alternatives proposed by them. Phase I, completed in late 1977, examined a number of alternatives, which are described in Chapter II of this EIS. It resulted in a recommendation of a workable set of feasible, acceptable alternatives for both rail car classification and trailer-on-flatcar (TOFC) operations. Phase I included a preliminary examination of cost factors and major potential environmental impacts.

PHASE II

The second phase of the MARGE Project, of which this EIS and its Technical Supplements are the major products, began at the end of 1978, and proceeded with detailed analysis of the representative operating alternatives developed in Phase I. Rail operations analyses and engineering work were carried out in tandem to provide preliminary drawings and cost estimates for each alternative examined. An environmental analysis and a preliminary benefit/cost analysis were carried out for all alternatives. Contributing studies of labor impacts, the redevelopment potentials of land freed from unproductive rail use, and legal/institutional issues were undertaken as well.

A community participation program was initiated to involve local communities and the general public, and the Federally-mandated "Scoping Process" (40 CFR 1501.F) was applied to involve interested agencies at all levels of government. Both the scoping and public participation programs are described in the Appendix to this Volume. To complete Phase II, this EIS and its associated Technical Supplements will be reviewed by all interested parties; a formal Public Hearing will be held; a decision will be made as to the best course of action for the St. Louis Gateway; and a Final EIS will be published. The Technical Supplements may be obtained from the offices listed on the front page.

PHASE III

Should the selected course of action involve the implementation of improvements to the Gateway, the MARGE Project will move into Phase III. This last phase, covering several years, will involve securing necessary financing, preparing construction and right-of-way plans for the improvements, establishing the appropriate institutional arrangements for construction, ownership and operation of such improvements, and actually constructing the project. The end of Phase III will result in the completion and operation of the improved facilities for the St. Louis Gateway.

SUMMARY

Restructuring the major rail gateway in the St. Louis Metropolitan Area is necessary to significantly reduce rail car transit time, to ensure the Gateway survives as a viable route for shippers through the Year 2000, to reduce rail/community conflicts, and to provide opportunities for economic and community development. Solutions to the Gateway's problems involve developing reasonable restructuring alternatives and securing agreements of various kinds from the operating railroads, labor organizations, and federal, state, county, city, and municipal agencies.

The project proposes three alternative plans for replacing the extensive, disorganized, and now largely unused pattern of rail yards that were privately developed in the Illinois part of the metropolitan area by the railroads during the last century. The plans are for Two-Yard, Three-Yard Directional, and Three-Yard Bidirectional systems. A fourth "No-Build" plan was studied to permit quantifying the changes each alternative will introduce, as well as the effects of not constructing the project.

The Two-Yard plan would expand two classification yards, the Gateway Yard south of East St. Louis and the Madison Yard in the east part of Venice. The Gateway Yard will be expanded eastward into agricultural and residential areas partially within the limits of Centreville, and the Madison Yard will be modified and extended southward beyond the residential areas of Brooklyn and National City.

Both Three-Yard plans would expand the Gateway Yard, improve the Madison Yard, and construct a new yard just south of Madison and near Brooklyn. The Madison Yard would then be an industrial support yard, and the New Yard would handle classification functions. Under the directional plan, one yard would handle eastbound traffic, and the other would handle westbound traffic. Under the bidirectional plan each yard will route traffic in all directions.

Related work proposed under all the build plans include relocating part of Illinois Route 3, building a common trailer-on-flatcar (TOFC) yard east of Brooklyn and north of East St. Louis, upgrading much of the trackage and signalling systems in the 82 miles of main line rail corridor, and constructing 17-18 grade separation structures. Nine of these grade separations would also be warranted if no rail improvements were undertaken, i.e., the No-Build plan.

Financial analyses show all three build alternatives are economically justifiable, but that the Three-Yard Bidirectional plan would perform best from the railroad operations standpoint. It has the lowest annual and per-car operating cost, the lowest transit time and number of cars delayed daily, and the highest benefit-cost ratio and internal rate of return.

The capital investment required for any of the three "build" alternatives ranges from about $600 million for the Two-Yard plan to $700 million for the Three-Yard Directional Plan. These costs include both railroad facilities investments and associated costs (such as grade separations, relocation of Illinois Route 3 and mitigative measures).

The present value of the rail operational benefits ranges from $782.7 to $1,027.8 million (assuming a 10% discount rate and no partial benefits accruing during the 8-year construction period). Addition of employment and community economic benefits, the value of reduced delay to automotive traffic, and the value of the enhanced safety of the new facilities, would nearly double these figures.

This Draft Environmental Impact Statement (EIS) discusses and analyzes the above proposals for their effects on 20 specific areas, six of which were determined to be of major importance. The six are socioeconomic environment, noise impacts, natural ecological systems, recreation, transportation, and cultural resources.

The MARGE Community Involvement Program (CIP) served to identify controversial issues in these areas through both informal and formal means. A committee structure incorporated representatives of public agencies and local communities, while general informational meetings provided a forum for individual citizen concerns. The most controversial centered on the relocations which would be caused by the project. Increased noise from rail operations was also of interest as well as possible effects on employment. These are discussed in this EIS and will continue to be addressed as the project proceeds. CIP is described in greater detail in the Appendix to this Volume.

<u>The socioeconomic environment</u> will be affected in two ways, through displacements and employment. Project displacements, both residentail and business, will be spread among 14 cities, townships, and unincorporated areas. Depending on the alternative selected, maximum household displacements will range from 222 to 251. Maximum business displacements will range from 32 to 35. Preliminary data indicates some communities may have shortages of adequate, decent, safe, and sanitary replacement housing. Project implementation would insure that the broad requirements of Public Law 91-464 (the Uniform Relocation Act) will be met; that is, adequate housing will be available for those displaced before construction begins. To accomplish this, 20 or 32 housing units may need to be constructed, at a cost of $1.0 to $1.5 million, depending on the alternative.

Four effects are foreseen on <u>area employment</u>. First, project construction will require an estimated 8,500 to 9,400 person-years of labor (split about 20% skilled, 30% semi-skilled, and 50% unskilled). In addition, it is estimated that 3,700 to 4,100 new jobs may be induced in the local communities over the eight-year construction period.

Second, improving yard efficiency will reduce railroad labor requirements, but no major job losses will occur. Possible reductions will range from a low of 77 to a high of 539, but labor protective agreements will eliminate the effects of this reduction for the first six years. Only 2 to 27 of the surplus workers will remain unemployed at the end of the protective period, if past attrition rates continue. The

national trend in the rail industry has been toward a steady reduction in the number of rail jobs. If this trend continues, and holds in the St. Louis Gateway, the number of rail jobs lost may well be less than the 77 to 539, and the project may actually increase the number of rail jobs. Third, increased efficiency of trailer-on-flatcar (TOFC) yard operations may eliminate some 355 non-railroad jobs. Fourth, project implementation would have an overall positive effect on local employment by strengthening the local infrastructure, thereby attracting new businesses. Project implementation would also free currently underutilized land for redevelopment, which could lead to the creation of jobs.

The project will reduce the noise levels experienced by some 1,584 residences which are currently exposed to noise levels greater than an L_{dn} of 65 dBA (which is the property line standard proposed by the U.S. Environmental Protection Agency) from existing rail facilities. This reduction is due to increased efficiency of traffic routing on main lines and from noise barriers constructed as part of project improvements. From 9 to 18 percent of the residences currently exposed to railroad noise impacts would experience these reductions. In addition, short-term construction noise effects can be mitigated through construction specifications, and by building certain noise barriers before constructing expanded yards.

The natural ecological systems in the American Bottoms have been greatly altered by urbanized and industrialized development, and the remaining natural habitats are significantly stressed by proximity to high population and industrial concentrations. Most project construction will occur on cultivated fields, old fields, and in urban areas. Some construction will also occur on wetlands, a sensitive and more concentrated habitat.

The most significant ecological effect of project implementation would be from constructing the common TOFC facility in a 420-acre area currently occupied by agricultural land, a landfill, and a truck repair facility. Some 57 acres of wetland would be completely lost, as would one and one-third miles of stream habitat. A comprehensive literature search and field reconnaissance uncovered no data indicating that implementing any portion of the project would cause extirpation of any species of flora or fauna.

Other long-term, or permanent, effects include partial losses of wetland habitats resulting from expanding the Gateway Yard, corridor additions, interlocking modifications, and the Route 3 relocation; a partial loss of riparian and aquatic habitat along 700 feet of Harding Ditch, resulting from the Gateway Yard expansion, and the loss of 250 to 300 acres of prime agricultural land. Short-term impacts are defined as occurring only during construction. For the MARGE project short-term impacts include disruption and increased turbidity in aquatic and wetland habitats.

The severity and significance of the overall effects on the area's ecological system will largely depend on the success of measures taken to lessen the impacts. These mitigative measures will yield more ecologically sound and valuable habitats with greater carrying capacities.

Recreational areas might suffer one loss, through the taking of about nine acres of Lee Park in Venice by an interlocking connection which would provide bridge access for north-south rail traffic. The displacement represents about 28 percent of the park, which is owned by the Venice Park District. The 4(f) discussion included in this EIS describes this park and the proposed actions which might affect it. With approval by the Venice Park Board, the nine displaced acres of parkland would be replaced with comparable acreage and facilities elsewhere in Venice.

Transportation effects include improved rail transit through the Gateway terminal and improved vehicular traffic flow in the project area.

The average 46-hour rail car transit time through the Gateway in 2000 can be reduced by 10 to 17 hours, depending on the alternative selected. This will produce savings through more efficient use of rail cars and through reduced shippers' inventory carrying costs. These annual savings (in 1980 dollars) at Year 2000 traffic levels are estimated to range between $40 and $67 million.

New rail/highway grade separation structures will improve vehicular traffic flow through the project area. Separation structures over new or expanded yards will save an estimated 2,367 vehicle-days in the year 2000. In addition, grade separations at rail corridors warranted under each alternative will save an additional 9,139 to 9,380 vehicle-days. The resultant benefits, even with a value-of-time of only $4 per hour, would equal more than $1.5 million annually. Since nine structures are also warranted even if no rail improvements are made, their construction might also occur without the project.

The potential effect of the project on Cultural (archaeological, historical, architectural) resources was assessed. An initial reconnaissance survey identified some 36 historic sites and structures which might have historic significance. Based on preliminary testing and evaluation, 24 of these appeared to require no further investigation. Further work is necessary to determine significance for four more sites, and the remaining eight sites will be referred to the Keeper of the National Register of Historic Places for a determination of eligibility. Detailed 106(e) Case Studies will be prepared for any sites determined to be eligible. Close coordination with the State Historic Preservation Officer (SHPO) and the federal Advisory Council on Historic Preservation will be maintained to ensure adequate mitigation of any adverse impacts of the project on such sites.

Another area of concern is the protection of archaeological sites associated with prehistoric habitation of the Illinois portion of the St. Louis Gateway. This area is located in the heart of the American Bottoms region, which has been identified as containing extensive evidence of aboriginal occupation. For the most part, sensitive sites have been avoided in the development of restructuring alternatives in the MARGE

Project, but some areas in the northeast and southernmost segments of the restructuring area, will require further study. A total of twenty-three sites were identified at locations in the TOFC yard, the Gateway extension and two interlockings. Of these, only seven will require additional testing to determine significance. Consultation with Federal officials will be sought and the continuing involvement by the SHPO will assure compliance with cultural resource preservation guidelines.

In sum, all adverse environmental consequences of implementing the Project can be adequately mitigated with the exception of the total loss of the 250 to 300 acres of prime farmland. This loss is ameliorated by the fact that all of this land is located in urban fringe areas, where it is already subject to major pressures. Otherwise, the mitigation measures proposed will often even lead to an improvement in the environment.

Table of Contents

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

Section I

CHAPTER I

PURPOSE AND NEED FOR THE PROJECT

INTRODUCTION

The purpose of the studies reported in this Draft Environmental Impact Statement (DEIS) was to seek solutions to certain rail operational problems, to rail/community conflicts, and to constraints which inhibit economic and community development, while minimizing environmental impacts. The present rail operations in the St. Louis Rail Gateway (see Exhibit A) have been judged by the railroads and major shippers to be too costly, too unreliable, and too slow. The project proposes to rectify these problems by upgrading rail corridors, consolidating and rehabilitating rail yards, consolidating TOFC activities, and constructing interconnectors between rail corridors. Rail/community conflicts will be reduced and accessibility improved as a result of constructing noise and safety barriers and buffers, by constructing key grade-separation structures, and by relocating Illinois Route 3. In addition, restructuring of the Gateway rail system will allow the redevelopment of prime land along the Mississippi Riverfront now occupied by underutilized rail facilities.

The proposed restructuring, as described in this DEIS, will take place in the St. Louis Standard Metropolitan Statistical Area (SMSA). The brunt of the physical improvements, and hence, the attendant environmental impacts, however, will be concentrated in the Illinois portion of the SMSA, called Metro-East. Thus, most of the attention of this DEIS is focused on that geographic area.

The St. Louis Gateway comprises some 60 rail yards and numerous corridors located on both sides of the Mississippi River in Illinois and Missouri. What is now a rail gateway was developed over the past century by a large number of individual railroad companies. Coast to coast freight service is accommodated through the exchange of cars among railroad companies operating only in the eastern or western halves of the country. Currently, only four of the fourteen line-haul carriers operating in St. Louis operate on both sides of the Mississippi; the remaining ten carriers must interchange their cars in the Gateway. The three other St. Louis area railroads are terminal carriers, or switching roads, only. They serve the line-haul carriers in making car interchanges, and serve local industries.

Currently, switching operations occur in numerous proprietary yards; incoming trains must be broken-down and cars distributed to other railroad yards for reassembly into outbound trains. A similar situation occurs in the movement of flatcars with trailers through the Gateway except that a considerable interchange of trailers between one rail carrier's yard and the next takes place over the area's street and highway system.

The project proposes to reduce the level of interchange among the numerous yards by consolidating most switching activity into a few central yards. Also, a Common TOFC facility, which would significantly reduce the number of rubber-tired interchanges needed to get trailers through the Gateway, is proposed. The anticipated result of these changes is a much more efficient and improved Gateway.

If the St. Louis Gateway is to continue to function as a major node in the national rail transportation system, the project proposed here must take place in a timely manner. The following factors, all of which have relevance at the national policy level, serve as evidence of this:

- The 17 railroads operating in the Gateway account for over half of both the Nation's Class I railroad mileage and revenue generated

- Projections indicate that the number of rail cars to be processed through the Gateway in the Year 2000 will be nearly double the current level of 2.4 million

- The Gateway's unique location in the center of the Nation is greatly enhanced by its proximity to a highly developed highway system, and to the Mississippi River, the heart of America's inland waterway system

- The Gateway is also strategically located in the heart of the Nation's agricultural belt, as well as being close to major coal reserves and the major manufacturing centers of the Midwest.

All of these factors point to a continuing role for the St. Louis Gateway in maintaining the Nation's economic health. The Gateway serves, and must continue to serve, as a major focal point for handling goods ranging from raw materials to finished manufactured products. As the energy crisis continues to build, and as the Nation's population and industrial base expand, the significance of the St. Louis Gateway to the U. S. economy can only increase.

PURPOSE OF THE PROJECT

The project addresses rail-related problems through attempting to attain three goals:

- To improve the efficiency of the railroad operations within the St. Louis railroad terminal area

- To reduce rail/community conflicts

- To provide opportunities for economic and community development.

These goals were drawn in Phase I through recognition of the underlying problems: inefficient rail operations, rail/highway and rail/community conflicts, and rail impediments to economic development.

Inefficient Rail Operations:

The St. Louis rail terminal is inefficient. Facilities built in the early years of railroading have not been improved at the rate necessary to keep pace with traffic growth. In addition, rail car sizes and train lengths (both valuable improvements to rail efficiency) have increased beyond the specifications for which the yards and corridors were originally designed. While some capital improvements have been made, new technological developments have not been fully incorporated into the Gateway facilities. The direct result is a growth in the number of times that a given group of cars must be handled in order to process the traffic, increasing the cost, both in terms of time and money, of moving cars through the study area.

Rail traffic through the Gateway is expected to increase steadily until, in the Year 2000, it stands at a level 88% higher than 1979's. Without major changes the two main classification yards will not be able to expeditiously handle even moderate increases in demand. In that case, one or more of the following will occur: more and more rail traffic will be rerouted through other cities; more rail traffic will be diverted to other modes of transport; or the railroads (and hence, obviously, their shippers) will have to accept higher costs, longer travel times, and greater unreliability of service. Each of these would negatively impact the economy of the St. Louis area and the overall efficiency of the National transportation system.

The direct impacts of the Gateway's inefficiency are felt in two ways: first, increased average shipment times and decreased reliabilty of service force shippers to hold more inventory in-transit and at production facilities; and second, rail cars are used less efficiently. An extra day's average transit time through St. Louis requires an extra day's carhire payment and prevents a car from being free to handle another shipment.

From a rail system point of view, there is an important indirect impact of the Gateway's inefficiency, as well. The U.S. General Accounting Office has noted that freight cars spend 60 percent of their life in yards. Further, "If time in yards and terminals of all railroads was reduced 25 percent...the rail car cycle could be reduced from 26 to 22 days. This would be the equivalent of over 200,000 additional freight cars in the Nation's fleet." (USGAO, "There is No Shortage of Freight Cars - Railroads Must Make Better Use of What They Have", November 10, 1980.) More scarce resources (steel, fuel, and labor to build cars, not to mention the rail industry's capital to purchase them), must be invested in railcars to move the same volume of goods. These increased costs are of course passed along to the consumer in the form of higher prices.

Rail/Community Conflicts:

One major rail/community conflict involves local transportation. The widespread presence of rail yards and connecting lines has led to a contorted street and highway system in the St. Louis area in general and in the Metro-East area in particular. A substantial number of major arterial streets are subject to frequent interference from freight trains and switching movements, impeding the safe and efficient flow of people and goods. Although several projects have been undertaken to construct grade separations in the Metro-East area, the problems remain. Motorists waste both time and gasoline waiting at railroad crossings (or endanger themselves and rail employees by not waiting), and emergency vehicles, such as ambulances and fire engines, are either delayed or forced to take more circuitous routes.

Impediments to Economic Development:

Underutilized rail facilities are also impeding the economic development of the Illinois portion of the SMSA, which is among the Nation's most depressed areas. An extensive network of rail lines and yards developed along the Mississippi Riverfront in the early years of railroading when all goods had to cross the River by ferry. These facilities, now mostly abandoned or underutilized, occupy or block access to 1500 acres of land directly across from the thriving central business district of St. Louis.

The many railroad tracks which criss-cross the study area have fragmented and frozen the land use patterns of East St. Louis and other communities in the Metro-East portion of the SMSA. The legacy of little used warehouses, rail facilities, and abandoned property serves only as a reminder of the past. For example, in the late 1970's rail properties accounted for 25% of the land area in East St. Louis but provided only 12% of the City's property taxes. Local community attempts at redevelopment have been hampered by the diversity and complexity of railroad land ownership, as well as by the more obvious need to clear rail facilities from land prior to development, and to improve the limited access in the area. Still, local leaders and planning agencies indicate that this area constitutes the prime location for development in the metropolitan area.

PROJECT RESULTS

The relationship between the project goals and the solutions which evolved from the more than five years of preliminary study on the project, the year and a half of Phase I studies, and the three years of Phase II are summarized below.

Improvements to Rail Efficiency:

In the Year 2000, the proposed alternatives will reduce the average time needed to move rail cars through the Gateway by 22 to 37 percent (reducing the No-Build average of 46 hours to 29-36 hours). This is expected to result in a reduction of annual shippers' inventory carrying costs and carhire costs of $40 million to $67 million in 1980 terms. The present value of these savings will range from $185 million to $310 million.

Consolidating rail operations into modernized facilities will reduce the number of times cars must be handled, or switched. The inventory of existing conditions showed that 7,000 of the 9,000 cars moving within the study area daily are switched (77%). Further, these 7,000 cars require nearly 15,000 individual handlings (2.13 handlings per car interchanged). Under the Build Alternatives, some 11,000 of the total 17,000 cars in the Gateway daily in the Year 2000 (64%) would require switching, but the total number of handlings would be reduced from the 23,500 of the No-Build to as low as 15,500 (1.41 handlings per car interchanged, or a 34 percent reduction). This is a massive improvement in efficiency, and has much to do with both the increased reliability of rail operations under the build alternatives (since each handling represents another opportunity for a car to miss its connection with the outbound train), and marked decrease in annual rail operational costs.

The rail operating cost analysis indicates that in the Year 2000 the No-build Alternative would result in annual operating costs of nearly $380 million. In contrast, the Build Alternatives range from $225 million to $251 million, savings of $130 million to $155 million per year. In unit costs, this represents a decrease from the $82 per car of the No-Build to a range of $49 to $55 per car. The present value of the benefits resulting from the best of the three Build Alternatives (the Three-Yard Bidirectional Alternative) would be $1,540 million ($720 million if no partial benefits accruing during the eight-year construction period are assumed), using a 10 percent social discount rate. This includes the carhire and inventory carrying charges noted above. In rail operational terms, this translates to an internal rate of return of 22.8 percent, using a revised estimate of capital cost for that Alternative of $460 million. The Technical Supplement entitled Rail Operational and Cost Analyses of the Restructuring Alternatives gives full details on this analysis.

Reduction in Rail/Community Conflicts:

Improved rail operational efficiency also helps reduce the rail/community conflicts associated with train movements. Consolidating switching activities will reduce the transfer of cars from yard to yard within the Gateway area. This reduction provides two major benefits: reduced conflicts at grade-crossings, and reduced noise pollution impacts to residences.

Rail/highway conflicts will also be reduced by constructing grade separation structures. The seven structures proposed to bridge yard areas would save motorists some 2,400 vehicle-days in the Year 2000. Further, the nine to eleven structures warranted under each Alternative for corridor conflicts would save approximately 9,000 vehicle-days of delay annually. In addition to saving time, the grade separation structures would enhance public safety. Accidents would be reduced, and the response time of emergency vehicles would be improved. The Technical Supplement on Grade Separation Analysis contains a more detailed explanation of this issue, as well as lists and maps of the structures proposed under each Alternative.

Finally, the barriers and buffers proposed as part of the project would significantly improve the human and natural environment, reducing noise levels and providing protection from explosions, as discussed in the Noise Impact Analysis Technical Supplement.

Improved Potential for Economic Development:

The project will also create the potential for economic redevelopment, especially within the municipalities of East St. Louis, Brooklyn, Venice, Sauget and Centreville. Expansion of common rail facilities will eliminate the need for many Riverfront yards, permitting the creation of a large, continuous parcel of land. The relocation of Illinois Route 3, required to allow the expansion of the common classification yards, has been designed to provide good highway access to the Riverfront. The possibility of redevelopment has generated strong local interest, with several plans being discussed. For example, one plan developed by the architectural firms of Fleming Corporation and Skidmore, Owings and Merrill envisions three areas of development: a residential neighborhood and light industrial complex are considered for the northern end of the Riverfront parcel; commercial activity, an expansion of the Jefferson National Expansion Memorial (the Gateway Arch park) to the east side of the River, and residences for the central core area; and a major industrial expansion on the southern end.

Preliminary studies indicate that this plan is feasible and marketable, with the complete development package costing $220 million, and generating 8,000 permanent jobs and 3,000 to 5,000 construction jobs.

THE NEED FOR FEDERAL INVOLVEMENT

Resolving community concerns and removing a major bottleneck in the national rail transportation system depend on effectively restructuring rail operations in the St. Louis Gateway. The major barriers to wholesale terminal restructuring have always been the size of the investment needed and the difficulty of achieving consensus among the 17 railroads in the Gateway.

One of the compelling needs for the MARGE project is to provide the coordination missing from previous efforts by individual railroads to address their operating problems. In the past, the railroads' desires to avoid the congestion, inefficiency and expense of the existing rail network has motivated some piecemeal improvements. Those improvements which were good for one railroad, however, often worked to the detriment of others. Major rail network improvements were discouraged by the lengthy, cumbersome, and uncertain legal processes involved in acquiring rights-of-way. Further, the railroads could pay only limited attention to resolving community conflicts or accommodating other community planning concerns. Finally, the problems of the Gateway, while multi-faceted, always return to the single issue of sufficient common yard classification capacity. It was impossible for this ultimate solution to result from piecemeal attempts by individual railroads to address their own operating problems.

The fact that planning has proceeded to the point that each of the 17 railroads involved has endorsed the proposed project represents a major opportunity to resolve the difficult problems of the area expeditiously while attending to minimization of community and environmental impacts. Coordinating the Gateway improvements through the FRA- and IDOT-sponsored MARGE project will also reduce the difficulties associated with obtaining a rail consensus on financing the project.

Section II

CHAPTER II

ALTERNATIVES CONSIDERED

THE MARGE STUDY AREA

While the St. Louis MARGE Project focuses on a rail gateway of national significance, the study undertaken here must concentrate on a more localized site as a basis for examining rail operations and determining the potential impacts of alternative courses of action in the Gateway. Exhibit A illustrates the study area used for the MARGE Project.

This study area encompases parts of two states, Missouri and Illinois. It is basically defined by the major rail operations which comprise, or directly affect, the St. Louis Gateway proper. On the Illinois side of the Mississippi, the northern and southern boundaries of the study area are defined by the major entrance/exit points of the Gateway system (Lenox Tower, near Mitchell, Illinois, and Bixby Junction, south of Dupo, respectively). The easternmost boundary of the study area is the north-south portion of the Alton and Southern rail corridor. Contained within these boundaries are the major common classification yards of the Gateway, individual railroad "home" switching yards and TOFC facilities, and a network of corridors and interlockings which link these many facilities.

On the west, or Missouri, side of the Mississippi, the study area is largely focused on selected rail yards which interact with the main terminal yards on the Illinois side of the river. To the north are the Baden, Carrie Avenue, and Bremen yards; and toward the center of the study area are Gratiot Tower and the 12th Street, 23rd Street, and Ewing Avenue Yards. In addition to the facilities already noted, there are three rail crossings of the Mississippi located in the study area. On the south edge of the metropolitan area is MacArthur Bridge. On the north side of the area are Merchants and McKinley Bridges. Both MacArthur and McKinley also carry automobile traffic.

The study area described above and in Exhibit A (included in Section VI - Exhibits) was designed to permit a comprehensive operations analysis of the Gateway area. Development of the restructuring alternatives was based on this analysis. It should be noted, however, that while the core of the technical and planning efforts of the MARGE Project have been based on the boundaries of that study area, a number of environmental analyses have been undertaken using different, but logical and appropriate, geographic areas. For example, the SMSA has been used for the socio-economic impact analyses, as were census tracts and community statistics.

The second major point concerning the geographic focus of the MARGE Project is that it is aimed at the Illinois portion of the St. Louis Gateway area. This is not an arbitrary focus, but rather a response to the fact that the preponderance of the existing physical rail plant, and therefore the majority of the project's impacts, are located in the Metro-East area.

RAIL OPERATIONS IN THE GATEWAY

Rail operations in the study area are divided geographically by the Mississippi River, which is also the State boundary between Missouri on the west and Illinois on the east. The operations are also divided, institutionally, among 17 railroad companies and the City of St. Louis, Missouri, which owns and operates MacArthur Bridge. The railroad companies operating in the Gateway, with their name abbreviations, are listed below:

Alton and Southern Railway Company	(A&S)
Baltimore and Ohio Railroad Company (Chessie System)	(B&O)
Burlington Northern Inc.	(BN)
Chicago and Northwestern Transportation Company	(CNW)
Chicago, Rock Island and Pacific Railroad Company	(CRIP)
Consolidated Rail Corporation	(CR)
Illinois Central Gulf Railroad Company	(ICG)
Illinois Terminal Railroad Company	(IT)
Louisville and Nashville Railroad Company	(LN)
Manufacturers Railway Company	(MRS)
Missouri-Kansas-Texas Railroad Company	(MKT)
Missouri Pacific Railroad Company	(MP)
Norfolk and Western Railway Company	(NW)
St. Louis - San Francisco Railway Company	(SLSF)
St. Louis Southwestern Railway Company	(SSW)
Southern Railway System	(SOU)
Terminal Railroad Association of St. Louis	(TRRA)

Since Phase II began, the St. Louis operations of the CRIP have been sold to the SSW. Further, a merger of the SLSF and the BN has been accomplished, and several other mergers and acquisitions are pending. The operational impacts in the Gateway of each of these has been assessed, with no major changes required in the analysis (although minor revisions in facilities design had to be made to allow for new connections between merging roads). For the purposes of clarity, the study has been presented as though each of the above continued in its separate existence.

Rail operations on the west, or Missouri, side are conducted predominantly by the BN, MP, SLSF, NW, and MKT railroads, which are Class I (i.e. revenues of over $50 million per year) line-haul carriers, and by the MRS and TRRA, which are switching carriers. The major yards on the Missouri side are operated by MP (12th Street), SLSF (Lindenwood) and NW (Luther), with these and other carriers operating several lesser yards. The major rail terminal functions performed on the Missouri side are the classification (i.e. make-up and break-up) of trains by each of the roads in their own facilities, and industrial switching, performed primarily by MP, NW, and TRRA. Interchange of traffic among railroads on the west side is limited.

The balance of the railroads operating in the study area have yard facilities on the east, or Illinois, side. The MP, N&W, and TRRA also have facilities in Illinois. Each road operating on the Illinois side performs train classification in its own facilities, except for the N&W. The TRRA and the A&S perform most of the industrial switching and the interchange of cars among carriers on the east side, although several pairs of linehaul carriers have direct connections with one another.

EARLY STUDIES OF THE ST. LOUIS TERMINAL

The contemporary search for solutions to the problems of the Gateway began in 1968, when the City of East St. Louis asked the East West Gateway Coordinating Council (EWGCC), the bi-state region's A-95 and Metropolitan Planning Organization, to develop a rail relocation study for the SMSA. EWGCC, after exploring the possibility with various federal agencies, was unable to find an appropriate funding source for such a study. The first analysis of alternatives to restructure rail operations was undertaken shortly thereafter by the TRRA. It focused on the expansion of TRRA's Madison Yard southward along Willows Corridor to Rose Lake Corridor. This plan was rejected because the physical constraints of Rose Lake Corridor prohibited reasonable expansion to accommodate future projected traffic.

In mid-1971 EWGCC approached the Federal Railroad Administration (FRA) regarding new federal programs which provided the possibility for funding a comprehensive study of the St. Louis Gateway. Such a study was undertaken, and in 1974 three alternative plans were presented to EWGCC by the project consultants. While there were some significant differences, all three had several features in common:

- A 1300-acre parcel of riverfront property would be vacated
- The existing major rail corridors through the City of East St. Louis (21st Street, 42nd Street, Q Tower, and Belleville Corridors) would remain in their present locations
- All industries then receiving rail service would continue to be served.

Alternative I proposed that the two major switching railroads in the St. Louis area, the A&S and the TRRA, retain their corporate identities, thus providing a competitive situation for the available traffic. The line-haul railroads would continue their present operations into and out of their individually-owned yards. A new facility would be provided for the TRRA and the existing facility for the A&S would be improved.

Under Alternative II the TRRA and A&S would be reorganized to form a single terminal company with unified terminal operations. Line-haul railroads would change their present procedures and operate into and out of a common facility. A new "master" yard augmented by appropriate industrial support yards, would be provided for the receiving, classification, and departure of all trains in the St. Louis area. This yard would have been eight miles long and supposedly handle 15,000 cars daily. Finally, under Alternative III, the A&S and TRRA would be reorganized to form a new terminal company with unified terminal operations, but the line-haul railroads would continue their operations as in Alternative I.

The consultants recommended Alternative II as showing the highest benefit/cost ratio with the greatest operating efficiency. It represented substantial changes in the operation of the Gateway, applying single road operating techniques to a multi-railroad situation.

The railroad companies rejected the plan as operationally infeasible. From their perspective, the "master yard", with its massive computerized switching control, was impractical and unnecessary. It would have been twice as large as any facility existing in the United States, and represented the application of untried or unproven technologies. The railroads were also not comfortable with combining the two switching companies into a single operation. Further, the plan did not consider intermediate measures to address the objectives, nor did it explore options such as through trains, pre-blocking, or changes in trackage rights, operating procedures and labor agreements. Finally, the consultants failed to consider the effects on the environment in an area of prime agricultural land which was also rich in cultural resources.

The railroads then advanced a skeletal counterproposal, which was submitted to the FRA for comment. The proposal revolved around the concept of upgrading three major yards: A&S's Gateway Yard, TRRA's Madison Yard, and Penn Central's Roselake Yard. These would become the focal points for eastside rail operations, handling the preponderance of classification and switching activities. Other yards would be downgraded or eliminated, and a much greater emphasis would be placed on preblocking and run-throughs as a method for reducing rail car time through the area. This plan would result in most rail traffic being consolidated into the existing corridors by either relocation or trackage rights agreements. It would, therefore, result in the elimination of railroad operations from the riverfront.

CURRENT STUDIES

The three-phase project of which this document is a part evolved from the railroads' counterproposal noted above. This second major study effort, initiated in July 1976, resulted from the acknowledgement by the FRA that further analysis would be necessary to develop a realistic operating plan which could be presented to the various communities for their evaluation and consideration.

While the objectives of the initial study were determined to be appropriate for the new effort, a Railroad Technical Advisory Committee (RTAC) of operating department representatives from the 17 railroads was formed to develop workable concepts for the restructuring. The list of the railroads given above is also a membership list for the RTAC.

A Steering Committee (RSC) of railroad executive officers was also formed to oversee the work of the RTAC and the consultants and to review and approve operating alternatives proposed by them. The charge to the RTAC was the development of a physical plan which would be operationally feasible and acceptable to the railroads concerned. Development of an

acceptable operating plan was the first step in achieving complete restructuring. Again, in recognition of the fact that a complete restructuring plan must address issues of environmental impact and community development, as well as railroad operations, finance, corporate structure, and labor impacts, the FRA conceived the project in three phases - a feasibility study, a detailed planning study and finally, implementation. These phases were more fully described in the Foreword to this DEIS.

PRELIMINARY ALTERNATIVES

A number of alternatives were studied in the early stages of the MARGE Project. These were evaluated from the viewpoints of providing adequate classification yard capacity, general engineering feasibility, general operational feasibility, and avoidance of major adverse environmental impacts. Major alternatives for classification and other functions examined but eliminated from consideration are outlined below with the reasons for their elimination:

- Expansion and modification of Alton and Southern's Gateway Yard and Conrail's Rose Lake Yard. While this alternative would have provided necessary classification capacity and was operationally feasible, it would result in severe adverse impacts on the community of Fairmont City through long-term disruption and dislocation, and likely severe impacts on cultural (archaeological) resources.

- Expansion of Gateway Yard by constructing a receiving and departure yard (approximately 50 tracks) directly east of the existing yard and through Centreville, Illinois. Again, while meeting capacity requirements, this alternative would have had unacceptably severe impacts in the City of Centreville, a community which already feels the effects of the existing Gateway Yard. However, the problems encountered with this alternative spurred additional study and some of the basic concepts involved survived in the three alternatives selected for detailed study in Phase II of MARGE.

- Several alternative sites were studied for constructing a new classification yard. A site at Rose Lake was discarded because of its adverse impact on Fairmont City. A Valley Junction site was eliminated because of significant archaeological finds in the area brought out by preliminary survey work. Use of the existing Madison Yard site for a new yard was ruled out because of the severe disruption of traffic flow through Madison Yard caused by construction of a new yard. Finally, a potential site at Mitchell was dropped because it was simply too far from the remainder of the Gateway to function as the rail "hub" a common classification yard is intended to be.

- Several alternative supplementary sites on the west side of the Mississippi were also studied, most notably for industry support. Bulwer Yard and both Carrie Avenue Yards were considered for this purpose, but were eventually eliminated as feasible comprehensive alternatives emerged on the east side of the river, obviating the need for significant west side restructuring. In addition, the decision to relocate the General Motors plant from St. Louis to Wentzville, Missouri, removed a major need for a west-side industry support yard.

- A concept of constructing two TOFC yards was developed to be associated with potential operation of the Gateway in a directional mode. This approach was eventually eliminated because its advantages, even in a directional gateway, were outweighed by the substantial benefits of operating a single common bidirectional TOFC facility.

- Two major river-crossing alternatives were examined and discarded. One involved conversion of the upper deck of MacArthur Bridge (now used by automobiles) to rail use. However, excessive grades and consequent high construction costs made this approach infeasible. Second, a new rail bridge across the Mississippi was studied in contemplation of the possibility that existing bridges could not handle projected rail traffic. The cost of such an undertaking, eliminated this alternative from further consideration. This latter option is discussed further in the attached 4f Discussion.

- Other alternatives beyond the jurisdiction of FRA were also examined. These included encouraging traffic to be handled in another Gateway such as Chicago, Memphis or Kansas City, or a diversion of rail traffic to trucks and barges. It was determined that each of these "external" alternates would decrease rail efficiency, or increase rail transportation costs, even more, or would only transfer the problem to another locality. This is evident in the fact that so much traffic is handled in St. Louis now, despite its current inefficiency and high cost - obviously, few if any cheaper, more efficient alternatives exist, or the traffic would not be in St. Louis. Further, no justification could be found for believing that the costs of production at another terminal would be less.

As a result of preliminary examination of many alternatives in Phase I and the early stages of Phase II of the MARGE Project, three alternatives were determined to be representative of major conceptual approaches to improving the St. Louis Gateway and to merit detailed study and evaluation. Along with the "No-Build" alternative, which must be studied to furnish a baseline condition against which to comparatively evaluate action alternatives, the three approaches are outlined below, and described in more detail in the remainder of this Chapter.

No-Build Alternative:

As a bench mark against which to analyze the Build alternatives, a "no-build" situation has been studied. This plan assumes that no improvements are made to the Gateway terminal, but also that the same traffic levels will exist in St. Louis in the Year 2000 as are projected for the Build cases. This traffic, to the extent it overtaxes the common classification yards, would be handled at individual rail yards.

Two-Yard Alternative:

This plan calls for the expansion of the two existing classification yards. The Gateway Yard, located south of East St. Louis, would be expanded eastward. (See Figure 3 of Section I of Volume II of this EIS.)* This area is partly within the boundaries of Centreville, Illinois and is currently agricultural and residential. The Madison Yard, which is just east of the residential areas of Venice, would be modified and expanded south (Figure I-2) past the residential areas of Brooklyn and National City.

Three-Yard Directional Alternative:

This plan involves the expansion of Gateway Yard (Figure I-3), minor improvements to Madison Yard and the construction of a third yard, the "New Yard" (Figure I-4). This third yard would be located just south of Madison Yard, adjacent to the town of Brooklyn. Madison Yard would then function as an industrial support yard with the classification functions transferred to New Yard. The Directional distinction refers to the operational plan for the yards, which would have one yard handle trains coming from the East and headed West, and the other coming from the West and headed East.

Three-Yard Bidirectional:

This plan is distinguished from the above only in the operational plan of car and train routing. Each yard would route traffic in all directions. The physical configurations of the yards would be similar to the Directional Plan, except that the New Yard (Figure I-6) would be located approximately 200 feet further from the residential areas of Brooklyn, and that the expanded Gateway Yard (Figure I-5) would be constructed about 200 feet farther south from the housing areas of Centreville.

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* Subsequent references to figures shall be made indicating the Section number first, then the figure number within that section, e.g., Figure I-4 of Section I. All figures are included in Volume II of this EIS.

FINAL RESTRUCTURING ALTERNATIVES

The four alternatives represent differing approaches to the restructuring of the physical facilities and operational functioning of the St. Louis Gateway. The only major characteristic shared by all the alternatives is the total rail traffic volume to be handled in the future. How each alternative handles that traffic distinguishes it from the others. In this section, each alternative is described separately. This discussion includes a tabulation (Table 1) which lists the significant operating characteristics of all four alternatives. The Table is presented to demonstrate how each alternative differs from, or is similar to, the other alternatives.

No-Build Alternative:

As its name implies, the No-Build Alternative assumes no physical changes will be made to the Gateway between the present and the Year 2000. This Alternative's characteristics are displayed in Table 1. There are several reasons for including a No-Build Alternative other than the "benchmark" argument presented above. First, the No-Build analysis is required by the federal regulations covering the EIS process. Second, in any study of a potential major capital improvement, it is necessary to establish the need for the improvement. It would be difficult to do this without examining what conditions would be like in the future if the improvement is not made, i.e. under a No-Build case.

It was decided that the maximum-likelihood possibility was that the railroads would continue to utilize the St. Louis Gateway, despite the additional costs of the resultant inefficiencies, simply because other alternatives (such as handling the traffic in another Gateway, or a diversion of rail traffic to trucks and barges) would increase costs even more, or would only transfer the problem to another locality. Therefore, the No-Build Alternative assumes that the same traffic levels will exist in St. Louis as are projected for the Build case. In terms of physical facilities, the MARGE No-Build Alternative is essentially identical to the present conditions of the Gateway.

The traffic volume assumption (an 88% increase in the Year 2000 over the volume in 1979) does, in fact, require some operational changes in the No-Build Alternative from present procedures. With the congestion which already exists in the Gateway, it is not surprising that the present common classification yards (Gateway and Madison) will simply not be able to handle all traffic in 2000. Therefore, it will be necessary to use a number of individual railroad "home" yards to handle the overflow traffic requiring classification. Clearly, with 60-odd rail yards in the Gateway, excess capacity may well exist. That capacity is not useful because of bottlenecks, and because is is simply not efficient for the massive interchange of traffic from eastern to western carriers and *vice versa* that occurs in the Gateway to take place in a dozen or more separate rail yards, scattered throughout the area.

TABLE 1

OPERATING CHARACTERISTICS

	Year 2000			
	No-Build	Two-Yard	Three-Yard Directional	Three-Yard Bidirectional
I. Traffic				
1. Cars entering Gateway each day, Year 2000:				
a. in through trains	1,070	1,070	1,070	1,070
b. in unit trains	4,870	4,870	4,870	4,870
c. in trains to/from local industry	1,650	1,650	1,650	1,650
d. in trains to be handled and forwarded	9,370	9,370	9,370	9,370
e. total	16,960	16,960	16,960	16,960
2. Traffic Loads in major common yards, Year 2000:				
a. inbound trains	55	77	110	102
b. outbound trains	68	100	126	112
c. cars to switch	4,020	6,565	8,434	7,552
3. Car Handlings				
a. total per day	23,445	18,046	17,824	15,503
b. car-handlings per car switched	2.13	1.64	1.62	1.41
II. Performance				
1. Average transit time, hrs.	46	36	33	29
2. Reliability-% cars meeting schedule	78	82	82	84
3. Average corridor speed (mph)	6.6	22.7	20.1	21.4

Such procedures, while they can be physically carried out in the No-Build situation, will certainly increase congestion in both the yards and corridors. This is best illustrated in Table 1 by the substantially greater transit time through the Gateway exhibited by the No-Build Alternative as compared with any of the "build" alternatives. That high transit time of 46 hours is also substantially greater than the average of 34 hours it currently takes a railcar to pass through the Gateway.

It could be argued that the uncertainties and delays associated with the No-Build Alternative will become intolerable to both railroads and shippers, resulting in shifts of traffic away from St. Louis to other gateways. In fact, recent experience has indicated that conditions in the St. Louis Gateway are already contributing to a modest trend in shifts away from the Gateway. Unfortunately, there is no way to accurately estimate the extent of such shifts, nor to gauge what impacts such shifts might have on other alternate gateways, other than as above, i.e. to note that St. Louis is still the Nation's second largest Gateway by far.

It should be emphasized that explicit in the No-Build Alternative is the assumption that the three major goals of the MARGE Project will <u>not</u> be met. That is to say, rail operational efficiency will worsen under the No-Build as will rail/community conflicts. No land will be freed, and no stimulus to local economic development will occur.

<u>Build Alternatives</u>:

The three action alternatives examined in this Draft EIS have unique combinations of physical and operating characteristics. It is also important, however, to understand that all of them share certain features. The listing below outlines those characteristics which are identical in form, as well as in cost, for all three "build" alternatives. Alternatives were also considered for these separate elements in order to select optimal designs and/or locations for them, independent of the yard improvements. It should be noted that the Common TOFC Yard and the grade separations are separable elements. While they further the goals of the project, their construction is not absolutely essential to its implementation.

- A common trailer-on-flatcar (TOFC) yard would be constructed east of Brooklyn and north of East St. Louis (Figure I-1). The location is convenient to a major interchange connecting Illinois Route 203 and Interstate 55/70, providing excellent access for trucks. A major rail corridor runs just west of the site. Eight or nine of the thirteen Class I carriers would consolidate their TOFC operations into that one yard. Five other prospective locations for the yard were evaluated and discarded as less advantageous. The analysis is described in the Technical Supplement entitled <u>Common Trailer on Flatcar Yard.</u>

- In order to improve rail transit across the Mississippi River, it is proposed to completely replace the three river spans on Merchants Bridge and add two connections from its approach to Q Corridor (Figure X-1). Several other alternative solutions were considered for the problem of inadequate railroad bridge capacity. These included: a new river bridge and rehabilitation of both Merchants and McKinley bridges to provide one full-load track on each. The span-replacement option appears the best for reasons of lower cost and less adverse environmental impacts. The analysis is discussed in a paper entitled Bridge Improvements in Section VI of this EIS.

- Seventeen to eighteen grade-separation structures are warranted under all the "build" alternatives, due to the large delay- and collision-related conflicts which occur in the project area. Seven of these would be warranted because of yard expansions; the remainder are warranted due to conflicts along the rail corridors. Nine structures would be also warranted under the No-Build Alternative. A discussion of the analysis and warranting procedures, along with maps and diagrams, can be found in the Technical Supplement entitled Grade Separation Analysis. Exhibits C and D in Section VI of this Volume depict all the locations where corridor separations may be warranted

In addition to the features noted above, there are several other characteristics which, while they may vary in scope or size or cost from alternative to alternative, are common to all the Build alternatives. These include the following:

- There are approximately 82 miles of mainline rail corridors in the project area and much of this would be upgraded under all of the "build" alternatives. A computerized Central Train Control system would be installed to improve efficiency, safety, and reliability of train movements within the Gateway. New or replacement track would be laid, and ties and ballast also replaced. All new rail would be continuously welded, enhancing safety and reducing noise and maintenance costs. Sections II through XI of Volume II of this EIS show each corridor plan.

- Several new rail connections or interlockings would be constructed, although the locations of the corridors and existing interlockings would remain the same. New interlockings are also shown on the corridor plan sheets in Sections II through XI of Volume II.

- A segment of Illinois Route 3 would be relocated in order to bypass the expanded yards. The designated section begins just north of McKinley Bridge in Madison County as four-lane highway and continues 3 miles south as a two-lane road through Venice and Brooklyn, past National City, ending at St. Clair Avenue in East St. Louis. The relocation would provide a two- or four-lane,

limited-access highway for this distance. While an exact alignment has not been selected as yet, three alternatives adjacent to the Q Corridor have been developed and assessed. Exhibits F1, F2 and G in Section VI of this Volume show the alignments considered. The advantages and disadvantages of each are described in the Technical Supplement to this EIS entitled Relocation of Route 3.

- Land acquisition requirements have been developed for each "build" alternative. While varying across alternatives, these requirements are brought about by new or expansion construction of yards, corridor improvements, Route 3 relocation, and construction of grade separations. A separate 5-volume report entitled Property Owners Profile discusses current land ownership in the study area. It is available at the offices listed on the cover sheet of this volume, as are all technical supplements referred to herein.

- Utility relocation requirements have also been determined for each "build" alternative, varying according to the scope and location of construction involved in each scheme. The Utilities Impact Technical Supplement discusses this area in greater detail

- Finally, mitigation measures have been recommended for each of the "build" alternatives. Of major importance is the potential relocation of residents and businesses in the Gateway Araa due to construction of new or expanded facilities and mitigation of wetland, wildlife habitat, and park area displacements. In addition, specific mitigation measures for noise produced by yard operations have been recommended for each of the "build" alternatives.

The remainder of this chapter focuses on the yard operating and cost characteristics of each of the three Build alternatives. These are the features which most clearly distinguish each Build alternative from the others. Referring to Table 1, and to Table 2, which summarizes the cost features of each alternative, may help to clarify the discussion.

Two-Yard Alternative:

In addition to the common features just outlined, this alternative has a unique configuration of yard/operations/cost characteristics. The Two-Yard Alternative is designed to operate in the directional mode. That is, each of the two major classification yards would handle classification traffic in a single general direction: Eastbound or Westbound. This is in contrast to the current bidirectional operation of both the A&S Gateway Yard and the TRRA Madison Yard.

The Two-Yard Alternative would expand both of the existing common classification yards just mentioned to handle projected increases in classification traffic in the directional mode. At the same time, the current industry support demand on Gateway and Madison Yards would continue to be handled by these two common yards.

TABLE 2
COST CHARACTERISTICS

	Year 2000 No-Build	Two-Yard	Three-Yard Directional	Three-Yard Bidirectional
I. CAPITAL (Millions of 1980 $)				
A. Direct Rail				
1. Yards				
a. Gateway		132.4	133.3	131.6
b. Madison		80.8	(a)	(a)
c. New Yard		N/A	151.8	142.8
d. Common TOFC		65.6	65.6	65.6
2. Corridor Improvements-Rehab. and Central Train Control System (CTC)		148.8	149.2	147.8
3. Bridge Improvements		61.5	61.5	61.5
4. ROW Acquisition		4.4	4.4	4.4
5. Utility Relocation		2.3	2.9	2.9
6. Residential & Business Relocation		7	8	8
7. Noise Mitigation		1	1	1
B. Subtotal Direct Rail Capital Costs	0	503.8 (b)	577.7 (b)	565.6 (b)
II. RAIL-RELATED INDIRECT CAPITAL COSTS				
A. Grade Separations				
1. Those due to yard construction		(c)	(c)	(c)
2. Those otherwise warranted	(d)	28.6	28.6	31.3
B. Route 3 Relocation				
1. Alternative 1 (West Plan)		31.6	31.6	31.6
2. Alternative 2 (East Plan)		35.3	35.3	35.3
3. Alternative 3 (Split Plan)		33.4	33.4	33.4
C. Riverfront Facilities Removal		61.2 (e)	61.2 (e)	61.2 (e)
D. Mitigation Measures		1	1	1
E. Subtotal, Rail Related Indirect Capital Costs		124.2 (f)	124.2 (f)	126.9 (f)
III. OPERATIONS				
A. Total Annual Operating Costs (Millions of dollars)	379.36	251.31	245.33	223.82
B. Annual Operating Costs Per Car (dollars)	82.14	54.88	53.57	48.88
C. Benefit/Cost Ratio (g)		1.68	1.53	1.85
D. Internal Rate of Return (g)		14.4	13.6	15.3
TOTAL CAPITAL COSTS		$628.0	$701.9	$692.5

TABLE 2 (Continued)
COST CHARACTERISTICS

Notes:

(a) Minor improvements; costs lumped with those of New Yard

(b) A value engineering analysis has indicated that these costs could be reduced to as low as $407.9 for the Two-Yard, $470.3 for the Three-Yard Directional, and $460.0 for the Three-Yard Bidirectional plans.

(c) Included in yard costs

(d) $28.2 million in structures warranted under No-Build, as well.

(e) Includes $56.2 million for the potential relocation of Continental Grain, Peabody Coal and the American Car Foundry facilities from the riverfront, and $5 million in other riverfront clearance costs.

(f) Includes $33.4 million for Route 3 relocation - the average of the three cost estimates.

(g) Based on Type I capital costs (direct rail) only, minus cost of grade separations, potentially required by yard construction. Note that use of the lower costs explained in note b, above, would result in greatly increasing these numbers. For example, the Three-Yard Bidirectional plan would have a Benefit-Cost ratio of 1.89, and an Internal Rate of Return of 22.8%, if these lower capital costs can be achieved.

Operationally, under this alternative, the trains of the linehaul carriers would be redirected as necessary so that switch trains of eastern carriers would generally be routed into the expanded Madison Yard rather than into the several existing home yards. Trains, then, of westbound carriers would generally be operated out of Madison Yard. The reverse would be true for the expanded Gateway Yard: western carrier trains would be operated into this yard, and eastbound carriers would operate out of it.

The expansion at Madison Yard (Figure I-2) would consist of extending the receiving tracks, which lie along the west side of the yard, in a southwesterly direction along the line of the current rail corridor extending from CP Junction to Bridge Junction (see Exhibit A, attached, for the locations of these rail tower control points), with the standing car capacity of the receiving track increasing 126 percent, from 682 cars (14 tracks) to 1540 cars (17 tracks). The 40 classification tracks in the bowl would be extended an average of 14 car lengths each, with a resultant increase in capacity of 44 percent. The number of pullout leads at the south end of the bowl would be increased from two to three, and the departure yard capacity would be increased 78 percent, from 1122 car lengths (26 tracks) to 1996 car lengths (30 tracks).

The capacity of Gateway Yard would be expanded by constructing a new receiving yard to the southeast of the existing bowl and hump leads and in line with them (Figure I-3). Receiving capacity would be increased by some 240 percent, from 962 car lengths (16 tracks) to 3268 car lengths (30 tracks).

A new departure yard would be constructed along the southwest side of the existing bowl, which would increase the standing capacity of the departure yard from its present 1057 car lengths (12 tracks) to 3872 car lengths (30 tracks), a 262 percent increase. The four existing pullout leads would be maintained. The number of bowl tracks would be increased from 54 to 72, with a standing capacity increase of 22 percent (2417 to 2958 car lengths).

The total construction cost of the Two-Yard Alternative has been estimated at about $628 million, the lowest capital cost of the three "build" alternatives. The Year 2000 annual operating costs have been estimated at approximately $250 million, the highest of the three "build" alternatives, but substantially lower than the $380 million estimated for the No-Build Alternative. The Two-Yard Alternative (including the strict rail operational improvements only, not the combined total of these and "indirect" costs for impact mitigation, etc., but using the high end of the capital cost range) exhibits a benefit-cost ratio of 1.68 and an estimated internal rate of return of 14.4%. Both the benefit/cost ratio and the internal rate of return for the Two-Yard Alternative lie between similar figures for the other two "build" alternatives.

The advantages seen in the Two-Yard Directional Alternative were (1) consolidation of traffic into logical groups so that the maximum number of cars would be dispatched with one handling; and (2) minimum construction and associated impacts necessary to accomplish these goals.

Three-Yard Directional Alternative:

In addition to the common features cited earlier, this alternative takes the concept behind the Two-Yard Alternative a step further in terms of size, capacity, and flexibility. In terms of its classification function, the Three-Yard Directional Alternative would operate similarly to the Two-Yard Alternative, with two major classification yards; one handling eastbound, the other westbound, traffic.

The major difference between the two alternatives is that the Three-Yard Directional Alternative involves construction of an entirely New Yard in lieu of the major expansion of the existing Madison Yard. The site chosen for the New Yard is between CP Junction and Q Tower, with the hump leads extending to the vicinity of WR Tower (Figure I-4). This site was seen as desirable because it is centrally located to railroad operations, and generally covers land area already primarily dedicated to rail and rail-related uses, with good access to the corridor system.

The New Yard would be substantially larger than the expanded Madison Yard contained in the Two-Yard Alternative. Receiving capacity of New Yard would be 2640 car lengths (20 tracks), as compared to 1540 car lengths (17 tracks) for the expanded Madison Yard under the Two-Yard Alternative. Similarly, New Yard's classification track capacity would be 3010 car lengths (72 tracks) versus 1840 car lengths (40 tracks) for expanded Madison Yard. Finally, departure capacity for the New Yard under this alternative would be 2740 car lengths (20 tracks) compared to 1996 car lengths (23 tracks) for expanded Madison Yard under the Two-Yard Alternative. One result of this proposed expansion in classification capacity has been the indication by some railroads that they might operate their outbound trains to the south out of New Yard rather than from Dupo, located at the far southern end of the Gateway. This change, permitted by the greater capacity offered by New Yard, would result in fewer car handlings for these railroads, thus reducing cost and increasing reliability.

Under the Three-Yard Directional Alternative, Gateway Yard would be expanded exactly as described under the Two-Yard Alternative (Figure I-3). In addition, Gateway Yard would operate in the same manner as under the Two-Yard Alternative; western carriers would operate into the yard, and eastern carriers would operate out of it.

Madison Yard's physical plant would essentially remain unchanged from what it is at present. It would operate, however, exclusively as an industry support facility, rather than as a classification yard with industry support functions as it does now. Madison Yard's receiving capacity would be 682 car lengths (14 tracks); its bowl capacity would be 1280 car lengths (40 tracks); and its departure capacity would be 1122 car lengths (26 tracks).

While minor modifications to Madison Yard would be made under this alternative to better suit the yard to sole use in industry support, it is not anticipated that the yard's functional capacities would change. Dedication of Madison Yard exclusively to industry support indicates that this yard would not only be able to handle industry traffic on the east side, but could also serve some Missouri industries that now use yards on that side of the Mississippi.

Total capital cost requirements for the Three-Yard Directional Alternative are estimated to be approximately $702 million, the highest cost of the three "build" alternatives. Annual operating costs are estimated at $245 million, a figure between that for the other two "build" alternatives. The Three-Yard Directional Alternative exhibits a benefit/cost ratio of 1.53 and an estimated internal rate of return of 13.6% (under the same limiting assumptions as noted above), in both cases the lowest of comparable figures for the three "build" alternatives.

The major advantages seen in the Three-Yard Directional Alternative were (1) even greater consolidation of traffic into logical groups, to minimize car handlings, than in the case of the Two-Yard Alternative; and (2) increased industry support capacity to better serve this important segment of rail business in the Gateway area.

Three-Yard Bidirectional Alternative:

This alternative utilizes the same basic physical plant as the Three-Yard Directional Alternative, with some reduction in capacity for both New Yard and expanded Gateway Yard. The lower capacity required to handle projected traffic under this alternative results in substantial savings, estimated to be about $10 million in yard construction costs.

The major difference between this alternative and the Three-Yard Directional Alternative is operational. Instead of grouping cars for directional classification, the bidirectional approach used traffic assignments which grouped traffic into the two common yards so as to minimize the hauling of cars between them. This alternative, on the one hand, has the advantage of requiring little, if any, transfer of locomotives and cabooses between yards. On the other hand, the disadvantage of bidirectionality is that the maximum groupings of cars for one destination do not occur, since several roads operate trains with the same blocks (i.e. groups of cars with similar destinations) out of both the common yards.

Under the Three-Yard Bidirectional Alternative, Madison Yard remains essentially the same as it is at present, except its function would become solely one of industry support, and minor changes would be made to enhance that function.

Gateway Yard (Figure I-5) would be expanded under this alternative, but not to the extent that it would be under either the Two-Yard or the Three-Yard Directional Alternatives. While the bowl capacity would be the same as in these other alternatives, receiving capacity would be increased to only 2125 car lengths (20 tracks).

This compares to a Gateway receiving capacity of 3628 car lengths (30 tracks) in the Three-Yard Directional Alternative. Departure capacity, while increased to 30 tracks as in the other two alternatives, would need to accommodate only 2898 car lengths.

The New Yard under this alternative would have a bowl capacity identical to that in the Three-Yard Directional Alternative (72 tracks with a capacity for 3010 car lengths) (Figure I-6). Receiving capacity would be 1968 car lengths (17 tracks), as compared to 2640 car lengths (20 tracks) in the Three-Yard Directional Alternative. Similarly, departure capacity would be 1988 car lengths (17 tracks), as opposed to 2740 car lengths (20 tracks) for the other Three-Yard Alternative.

The total capital cost of constructing the Three-Yard Bidirectional Alternative has been estimated at about $692 million, in between the other "build" alternatives. Its estimated annual operating costs of approximately $224 million are the lowest of the three alternatives. These cost figures result in a benefit-cost ratio of 1.85 and an estimated internal rate of return of 15.3% (under the same limiting assumptions), both of which are the highest figures for these investment measures with respect to the three "build" alternatives.

The major advantages seen in the Three-Yard Bidirectional Alternative were (1) a lower construction cost than the other Three-Yard Alternative; (2) lower annual operating costs than the other "build" alternatives, as well as lower than the No-Build Alternative; and (3) a relatively high degree of flexibility, which could make the system more responsive to future demands of traffic (with regard to both volume and size).

Conclusion:

As noted at the beginning of this section, Table 1 highlights comparative operating characteristics of the four alternatives examined, while Table 2 indicates their cost characteristics. Further information on the physical characteristics of the alternatives may be found in the Figures presented in Volume II of this EIS. Further detail on the operations and cost characteristics may be found in the Technical Supplement entitled Operational and Cost Analyses of Restructuring Alternatives, Volumes One and Two.

Section III

CHAPTER III

AFFECTED ENVIRONMENT

This Chapter describes the existing environment of the study area which would be affected by the MARGE project. The study area encompasses parts of Madison and St. Clair Counties in Illinois and includes the Municipalities of Brooklyn, Cahokia, Caseyville, Centreville, East St. Louis, Granite City, Madison, National City, Sauget and Venice (See Exhibit B at the end of this Volume). The project would also affect areas of several unincorporated townships. The discussion will proceed from the general to the specific and includes information on the study area's physiography, ecological habitats, wetlands, water resources, air quality, noise environment, natural and cultural resources, and its human or socio-economic environment. Technical Supplements to the Environmental Impact Statement entitled Natural Systems Analysis, Socio-economic Impact Analysis, and Noise Analysis, present more detail on the existing environmental conditions.

NATURAL ENVIRONMENT

Physiography:

The MARGE project lies in an area of the United States known as the American Bottoms, a broad, flat alluvial plain of the Mississippi River. (See Exhibit E at the end of this Volume.) The plain consists of two geologic formations, the Henry, a sand and gravel outwash directly overlying the bedrock, and the Cahokia, composed primarily of silts and clays, deposited over the Henry. The Henry Formation was laid down during the Wisconsin glaciation of the Pleistocene period, while the Cahokia dates to the more recent Holocene period. The eastern edge of the Bottoms is formed by a series of bluffs which rise above the floodplain.

The terrain is classified by the Illinois Geologic Survey as Valley Till, characterised by a high water table with excessive groundwater supplies and highly organic alluvial soils. Soil types include Darwin, Wakeland and Newart; all are well suited for agriculture. These soils are subject to flooding and ponding which is not totally eliminated by the area's levee system.

Topographic patterns show a definite orientation related to the cutting and filling action of the Mississippi River. River scour and deposition, which occurred when much of the study area was under water, has accounted for the limited number of topographical features which are present. The primary variations in elevation across the study area are the low lying areas (swales) and ridges which were created before the construction of the urban levee. However, much of the topography of the study area has been changed through extensive rail and industrial development over the years.

Elevations in the study area vary from natural high points of 420 feet above mean sea level (MSL) to natural lows of 395 feet above MSL within the swales (excluding drainage channels such as the Cahokia Canal). In comparison, the average river water level is approximately 390 above MSL. Although elevations of the land throughout the study area do vary by these

amounts, the area is basically flat with gradual slopes which are, in general, in the range of 0 percent to 5 percent. This presents definite problems with regard to natural site drainage.

The highest elevations within the study area reflect the construction of an urban levee in the 1950's. The levee ranges in elevation from 437 feet above MSL in the northern portion of the study area to 430 feet above MSL on the south.

Earth Systems:

The soil composition of the study area is the result of Mississippi River flood activity over thousands of years. Cahokia Alluvium is exposed at the surface throughout the project area. Interspersed throughout the alluvium are localized deposits of organic material. These deposits are very compressible and pose significant problems for building foundations and other types of construction activities.

Soils in the project area have all developed on the relatively recent alluvial deposits and Darwin-Karnak and Landes-Riley are the dominant soil associations. Darwin and Karnak are poorly drained soils which occupy nearly level to depressional areas within the project area. Wetness is a severe limitation on these soils, subjecting them to flooding (when not protected by levees) and ponding. These soils have severe limitations for non-farm uses due to a high clay content, high shrink-swell potential, seasonally-high water tables, susceptibility to flooding and ponding, and slow to very slow permeability.

Landes occupy nearly level to sloping positions on rounded, long, narrow ridges. They are well drained and have moderately rapid to rapid permeabilities. Landes has slight limitations for most non-farm uses (when protected from flooding), but limitations are severe when not protected from flooding. Riley soils are found in concave areas between ridges of Landes soils. They are nearly level and somewhat poorly drained. Limitations for most non-farm uses are severe (Wallace 1978, USDA SCS 1970). Methods of dealing with the problem of construction on all these soils is discussed in Chapter IV.

The subsoils in the study area are comprised mostly of poorly sorted sand, silt or clay containing local deposits of sandy gravel, which in many places overlies well sorted glacial outwash. The bedrock geology is Mississippi Upper Valmerveran, consisting of horizontal bedrock formations of limestone, shale and sandstone. The average depth of bedrock in the vicinity is approximately 120 feet below the surface.

Since farming is a major enterprise within the project area, the suitability of the soils for agriculture is of some concern. Many of the soil types classify as prime farmland if they are drained and protected from flooding. The extensive system of levees and drainage ditches provides the necessary drainage to many of the soils in order to have them classified as prime farm land (USDA SCS 1970, Fehrenbacher, et al., 1978).

The project area contains one of the highest yielding aquifers in the state. Utilization of the groundwater is fairly extensive, and the water table fluctuates significantly throughout the year, especially close to the Mississippi River. The primary water bearing zones within the alluvial aquifer occur at depths of 60 to 120 feet although these zones are sometimes moderately connected hydraulically to shallower sands (Schicht 1965).

The generally good quality of the groundwater has been degraded in localized areas, principally from leachate emanating from landfills (IEPA 1979, Illinois State Water Survey 1979a). One apparently unlicensed landfill has been identified within the project area. It is located in the southern section of the proposed Common Trailer-on-Flatcar (TOFC) yard. The types of waste dumped at this location are not known but appear to be principally nonmetallic materials from automobile salvage operations. These wastes may be contributing to groundwater contamination.

Water Resources:

The most obvious of the area's water resources is the Mississippi River, representing a dynamic force which has had tremendous impact on all aspects of development. The current of the river varies from approximately 2.06 feet per second (1.5 mph) in January to approximately 7.14 feet per second (5 mph) in March. The water level depends, of course, on the volume of water carried by the river, and fluctuates on a daily basis. The elevation of the river can fluctuate by as much as 6 to 8 feet over an 8 hour period. Over the course of a year, the total range of river fluctuation can be as much as 47 feet. Depth is a function of bottom topography, velocity and other factors, ranging from 10 to 30 feet during low water. Only one spot in the study area (immediately south of the abandoned Cahokia Power Plant) exhibits a depth of less than 10 feet at low water periods.

The natural wetness of the floodplain soils fosters a drainage system of natural streams and lakes, augmented by man-made channels and ditches, levees, gravity outlets and pump stations. Stream and storm water runoff entering the Bottoms from both the eastern uplands and from within the Bottoms itself, flows westerly to the Mississippi River. Natural features of the area include meander scars and oxbow lakes, such as Horseshoe Lake and the existing lakes in Frank Holten State Park.

The northern portion of the project area lies within the Cahokia Canal System. This 30-foot-wide canal flows in a southwesterly direction through the City of East St. Louis to the Mississippi River. The Harding Ditch - Canal No. 1 combined system forms the major drainage network in the southern section of the project area. Its source is Little Canteen Creek in the bluffs just east of Caseyville; from there it flows generally west and south, passing through Frank Holten State Park until it discharges into the east end of the Prairie DuPont Floodway. Several areas adjacent to the Mississippi River drain directly into it by means of small intersecting drainage channels. These highly urbanized areas lie east of the riverfront levee and include major portions of Granite City, Madison, Venice, Sauget, Cahokia, and East St. Louis.

The three municipal water systems in the East St. Louis area are directly or indirectly supplied by the East St. Louis and Interurban Water Company (ESLIWC), the largest of these systems. The ESLIWC obtains its supply from the Mississippi River at the Chouteau Island and East St. Louis Pumping Stations. In addition, the Sauget Industrial area and the St. Louis Stockyards systems receive their supply from groundwater sources (Metcalf and Eddy, Inc. 1976).

Flood Protection:

The floodplain is defined as all lowland and relatively flat areas subject to a one percent or greater chance of flooding in any given year (100 year flood). A system of levees protect the American Bottoms against a 200-year flood, which is a Mississippi River stage of 52 feet at St. Louis. The river remains, however, as one of the indirect causes of interior flooding, when high river stages block the gravity flow of both surface and groundwater runoff. Natural flatness of the terrain, poorly drained soils, a high groundwater table, and inadequate channel capacity add to the backwater ponding (SIMAPC, 1975). Both the Harding Ditch and Cahokia Canal systems, including the downstream reaches of their principal tributaries, generally have inadequate channel capacities and are subject to overbank flooding. Some small portions of the project area would be inundated during a 200-year flood. Less severe storms would cause flooding in most of the same localized areas but not to the same extent. A map showing areas of potential flooding is included as Exhibit C in the Natural Systems Technical Supplement.

Three regulatory programs exist for construction within the Mississippi River flood plain. Local regulations require a permit and specify a structural ability to withstand 100-year flood damage. Illinois Department of Transportation regulations cover development which may affect waterways or cause flood problems. The United States Army Corps of Engineers Section 10 Permit Program requirements regulate development affecting navigation, river course or flow, flooding, ponding or any similar conditions. Floodplain regulations cited in 24 CFR Chapter X, Subpart B, govern any construction in such areas.

Water Quality:

The Illinois Environmental Protection Agency (IEPA) is the regulatory agency responsible for enforcing water quality standards set by the Illinois Pollution Control Board. There are three major sets of standards in the State of Illinois: General Stream Standards, Effluent Standards, and Public and Food Processing Water Supply Standards. A particular set of standards is applied whenever a specified beneficial use is to be maintained. The IEPA's water quality network provides an extensive continuous chemical and physical monitoring data collected during the past years for area Illinois surface waters. The U.S. Geological Survey also has published a two-volume set of data for the years 1978 and 1979, prepared in cooperation with the State of Illinois and other agencies.

Several major sources of water pollution exist in varying degrees in the American Bottoms. These include both the point sources of municipal and industrial wastewater effluent and the non-point sources of agricultural runoff, coal mine wastes, and septic tank effluent (SIMAPC, 1972; 1978).

Streams in the project area exhibit numerous instances of violations for copper, iron, manganese, dissolved oxygen, ammonia, and fecal coliforms (SIMAPC, 1978).

Four existing primary wastewater treatment plants are presently serving the project area. In addition, there are approximately a dozen industries that provide individual treatment and disposal of their process wastes, and several industries that pre-treat their wastes before discharging to existing sewer systems (Metcalf and Eddy, Inc., 1976).

Approximately 760 acres associated with deep mines in Madison County, and some 555 acres associated with deep mines and 769 acres of strip mined land in St. Clair County, contribute to water pollution. Water quality degradation has occurred in parts of Richland Creek, Canteen Creek, and Cahokia Creek and its tributaries. However, water quality sampling data, taken from 1975 to 1977, indicates high natural alkalinity levels in most reaches of these streams which usually provides adequate natural bufferings.

Agricultural pollution levels tend to be rather high in the intensely farmed American Bottoms. Cropland is the dominant land use throughout the area and is the major cause of erosion, and sedimentation to downstream lakes and streams. Other types of agricultural wastes can enter the water via surface runoff and leaching. The most common chemical pollutants are pesticides, fertilizer nutrients, and livestock waste (SIMAPC, 1972).

The highly urbanized area of metropolitan East St. Louis presents a significant source of water pollution in the form of urban storm runoff. Industrial activities, commercial districts, and housing developments all contribute pollutants which eventually become part of the runoff water. Stormwater runoff contributes several pollutants to the streams, including solids, organic materials, fecal coliforms, and metals. The problems associated with urban runoff are increased when a municipality has a combined sewer system, where both domestic wastewater and urban runoff discharge into a common sewer system. A large part of the American Bottoms is served by combined sewers; the major municipalities are Venice, East St. Louis, National City, Sauget, and Madison (SIMAPC, 1977; Illinois Department of Conservation, 1972).

Canteen Creek drains a small watershed which includes agricultural bottomlands and some acid mine drainage in the uplands before discharging into the Cahokia Canal. The northern portion of the project area around National City and northern East St. Louis also drains directly into the Cahokia Canal. Horseshoe Lake is a major detention basin for the Cahokia Canal watershed. All of these features experience frequent water quality violations for fecal colifoms, iron, copper, manganese and other heavy metals.

All three of the lakes within Frank Holten State Park have been deteriorating recently due to a silt deposition and fluctuating water levels (Illinois Department of Conservation, 1970). General Stream Standards were exceeded for dissolved oxygen, fecal coliform, iron, copper, lead, manganese, and pH at various times at the IEPA stations within the Harding Ditch watershed. A Corps of Engineers study concluded that the waters of the Harding Ditch drainage area were relatively sterile, with only a few pollution tolerant benthic species found in the shifting mud and sand substate (Horner and Shifrin, 1973).

The Mississippi River is the final receiving water for all of the surface and groundwater passing through the American Bottoms. Several IEPA sampling stations are located on the River, including two which are on water intakes and are thus subject to the more stringent Public and Food Processing Water Supply standards. Violations for fecal coliform, copper, manganese, iron, mercury, and phenol are found along the river.

Ecological Systems:

The area of proposed construction and renovation of rail yards and corridors is centered in the East St. Louis section of the American Bottoms (Exhibit E). This section of the American Bottoms was once dominated by floodplain habitats and their indigeneous species of flora and fauna, associated with the geographical latitude. Today the area is heavily urbanized and industrialized with the remaining natural habitats existing in areas unsuitable for development or agriculture. There are no natural habitats within the proposed construction area which are not stressed to a significant degree by the high population and industrial concentration interacting with them.

There are seven habitat types discernible within the study area:

- Urban - characterized by residential, commercial and industrial land use. This use predominates in the project area. It is of little value for wildlife; most vegetation is non-indigenous

- Cultivated Field - devoted to agricultural use, primarily for row crops. This type has seasonal limitations as wildlife habitat

- Old Field - in transition from agricultural uses to stable forest or prairie habitats. Although few if any species which are adapted solely to this habitat, it does provide food and cover for generally adapted species (small mammals, birds, insects) for which other habitats are limited in the study area

- Wetlands - once the predominant habitat type in the study area, but have dwindled to isolated areas along rail and highway rights-of-way drainage ditches and lake edges. Remaining wetlands support a variety of faunal and floral species which do not thrive in other habitats.

- Riverine - acquatic habitat consisting of rivers and adjacent shore areas; limited in the study area due to levee construction and industrialization. The river itself is disturbed by heavy barge traffic and effluent discharge.

- Lotic - medium to small streams or creeks; heavily disturbed in the study area by dredging and channelizing, subject to urban and agricultural run-off. Therefore, local streams do not provide conditions suitable for harboring characteristic species

- Lentic - lakes and ponds; fairly limited extent in the study area. Three systems including Horseshoe Lake (2100 acres), Long Lake (85 acres) and a three-lake chain (218 acres total) in Frank Holten State Park, provide a shallow water habitat with relatively high nutrient levels and turbidity. They support a variety of wetland vegetation and characteristic faunal species.

The habitats most available to area wildlife are cultivated fields, old field and urban. These are interspersed and overlap throughout the entire area. The scattered wetlands are associated with low lying areas of poorly drained soils and borrow pits. The wetlands are categorized as sensitive, because of the species of flora and fauna restricted to them, the greater potential for affecting threatened or endangered species and the increasing loss of this habitat type to development and agriculture throughout the American Bottoms. The sensitive habitats which would be incorporated into areas of construction have been assessed through a comprehensive literature search and field reconnaissance.

No single wetland parcel associated with corridor alterations or interlocking modifications is greater than 1.5 acres in size, and the total of all parcels is less than 5 acres. Many of these have been formed by borrowing fill material for construction of already existing rail lines or are small depressions with poorly drained soils. The wetlands associated with construction of rail yards are also small and isolated with limited value to area wildlife through a lack of vegetational diversity and spatial continuity. Other sensitive habitats range in size from 4 to 5 acres and currently exist in varying degrees of ecological stress. Upland habitats have low potential for harboring threatened or endangered species.

The exception is the area proposed for the intermodal TOFC facility located northwest of the I-70 and Route 203 interchange. This area contains approximately 57 acres of wetland habitat, presently used as a landfill for non-metallic automobile scrap. The wetland vegetation is limited to cattails. There were no associated wetland vegetational species found during reconnaissance. Schoenberger Creek bisects the area in a northeast and southwest direction. The water quality of the stream was obviously poor, however, there was a variety of wetland fauna using the stream. All habitats are, however, heavily stressed by human disturbance.

The vegetation in the study area includes grasses, trees, weeds, and shrubs, especially these of early stage and second growth origins that now populate the areas disturbed by previous development. The early stage vegetation includes various species of goldenrod, bluestem, wild aster, beggar ticks, ragweed, smartweed, jimson weed, cockle-bur and foxtail.

The second stage growth is characterized by blackberry, rose, dogwood, elder, sumac and poison ivy. Trees such as hawthorn, crabapple, mulberry, box elder, American elm and black cherry are established and common within the study area. Mature bottomland trees are scarce in the study area. Periodically flooded riverbanks and other wet areas contain marsh vegetation such as sedges, smartweed, bur-reed and cattail. Along the ditches and levees are scattered creeping water primrose, smartweeds, arrowheads, and ragweeds.

The most common faunal species found along the riverfront include rabbits, mice, ground hogs, woodchucks, crickets, frogs, toads, snakes, squirrels, muskrats, and turtles. Fish populations consist of the wide-ranging group: crappie, blue gill, sunfish, bass, bullhead, carp and shad. The most common bird species in the study area include: sparrows, robins, starlings, bluejays, grackles, cardinals, redwing blackbirds, and crows. A variety of migratory waterfowl and shorebirds are found in the limited wetlands.

Threatened or Endangered Species:

The possibility exists that a variety of threatened and endangered species occurs in the project area. However, potential for the occurrence of endangered species within, or in close proximity to, construction areas, is low due to habitat conditions and locations. This is discussed further in Chapter IV and in the Natural Systems Technical Supplement to this EIS.

Meteorological Data:

The climate of the metropolitan St. Louis area is characterized by rapid changes in weather typical of a continental climate. The area experiences hot, humid summers and mild winters, punctuated by periods of extreme cold and extreme heat. Average precipitation is about 36 inches annually with the three winter months receiving approximately 6 inches of that total. The wettest periods are spring and early summer. Average annual snowfall is approximately 19 inches.

The average annual temperature is 56 degrees Fahrenheit with a January mean of 32 degrees and a July mean of 79 degrees. Normal temperature extremes range from minus 15 degrees Fahrenheit to in excess of 100 degrees. Relative humidity is 50 to 60% during the summer months. Prevailing winds are southerly for most of the year, except during the three winter months when they turn northwesterly. Finally, the St. Louis area averages 4,750 heating degree days and 1,475 cooling degree days each year.

Air Quality:

The Clean Air Act of 1970 40CFR50 et. seq., requires the Administrator of the United States Environmental Protection Agency (USEPA) to issue air quality criteria reflecting the latest scientific knowledge of the effects on public health or welfare expected from varying quantities of ambient air pollutants. Air quality criteria have been issued for the following pollutants: sulfur dioxide (SO_2), carbon monoxide (CO), total suspended particulates (TSP),, photochemical oxidants, oxides of nitrogen (NO_x), hydrocarbons (HC), and lead.

Based on these criteria and available pollution control techniques, the USEPA has published primary and secondary National Ambient Air Quality Standards (NAAQS) for each pollutant. These standards prescribe pollutant levels which may not legally be exceeded during a specific time in a specific geographic area. Primary standards are designed to protect public health, while secondary standards protect the public welfare, from any known or anticipated adverse effects associated with the presence of pollutants in the ambient air.

The location of the proposed project includes portions of St. Clair, Madison, and Monroe Counties, Illinois. Current NAAQS for CO and NO_x have been attained throughout each of these three counties and the attainment status of these pollutants is projected to continue for the foreseeable future. Each of these counties is currently designated non-attainment for photochemical oxidants. Consequently, the State of Illinois has developed a State Implementation Plan (SIP), designed to bring about attainment of the oxidant standard, and attainment is projected to occur some time after 1982 but before 1987.

The entire portion of St. Clair County and parts of Madison and Monroe Counties have not attained primary NAAQS for TSP. The remaining portions of Madison and Monroe Counties have not attained secondary TSP standards. Reanalysis of projected TSP concentration in these three counties is currently underway. Preliminary indications are that portions of these counties will continue to exceed secondary standards (and possibly primary standards, as well) during the foreseeable future. All of St. Clair and Monroe Counties and a large portion of Madison County are designated attainment for SO_2 dioxide, and this is expected to continue. However, the Illinois EPA is currently examining a portion of Madison County which extends from Alton/Wood River toward Edwardsville and is currently designated unclassified. The status of this portion of Madison County may be redesignated non-attainment in the future. No designations concerning the attainment status for the lead standard have been made at this time (Illinois Pollution Control Board rules and Regulations, as amended; Horner and Shifrin, 1973).

Current emissions resulting from railroad operations comprise 0.3% to 5.5% of the total pollutant emissions in the Illinois portion of Air Quality Control Region (AQCR 70), depending on the pollutant involved. Emissions of particulates, carbon monoxide, and sulfur oxides from rail operations are each 0.3% or less of total emissions, while emissions of hydrocarbons and oxides of nitrogen are somewhat more significant compared with total area-wide emissions.

Noise Environment:

In 1979 and 1980, the United States Environmental Protection Agency (USEPA) published standards for rail facilities and equipment (44 FR 22960 and 45 FR 1252). These standards are expressed in units called decibels, symbolized dB. The units are normally measured on a logarithmic scale designated the "A" scale, hence dBA. This scale runs from 1, the faintest sound perceptible to humans, to about 130. The extreme level, 130 dBA, is equal to the noise of a jet plane at 500 feet. The mid-range level of 50-60 dBA may be represented by the human voice heard at a distance of 3 feet.

Since noise from rail or highway traffic fluctuates with time and traffic volume, it is common practice in noise measurement to calculate an average sound level over an hour (L_{eq}). This is used in assessing highway noise and is stated, for example 60 dBA L_{eq}. For rail noise, the greater sensitivity of people to noise at night has been accounted for by deriving a 24-hour day-night level (L_{dn}) which weights nighttime noise emissions, therefore the USEPA's 65 dBA L_{dn} represents this weighted 24-hour average level.

A number of communities in the project area are subject to noise from railroad operations. Current noise levels were measured to provide a base for project future levels. Approximately 1584 residences in the project area are exposed to noise levels greater than an L_{dn} of 65 dBA from the existing railroad facilities evaluated under the project. All communities are affected but the impacted residences are concentrated in Granite City, East St. Louis, Alorton, Cahokia, and Dupo. Corridor or mainline operations affect the greatest number of people. The noise level from a corridor may reach 83 dBA L_{dn} at the worst case receptor.

Granite City is currently exposed to excessive noise from the Q Corridor. East St. Louis is affected by railroad noise from the Willows, MacArthur Bridge, A&S, and Q Corridors. The MacArthur Bridge and A&S Corridors impact the most people, who may be exposed to noise levels of 83 dBA L_{dn} at the closest receptors.

Cahokia and Dupo are currently exposed to excessive noise levels as great as 80 dBA L_{dn} from the Dupo Corridor. Few residences in East Carondelet are currently exposed to railroad noise, due to the small amount of rail traffic on the Dupo Bypass Corridor.

Noise levels from existing rail yard facilities affect a smaller number of residences than the corridors. Several residences in Venice are exposed to noise from Madison Yard. Areas of East St. Louis and Centreville are exposed to noise from Gateway Yard. The overall cause of Noise Impacts is discussed further in Chapter IV, and in the Technical Supplement entitled Noise Analysis.

HUMAN ENVIRONMENT

General:

As discussed in Chapter II, the broad area of concern for the project is the St. Louis Standard Metropolitan Area (SMSA), although the focus narrows to the Illinois portion for some elements and even further for others. To begin, therefore, at the broadest level of discussion, the socio-economic characteristics of the SMSA are presented, then figures are disaggregated and compared across the Illinois and the Missouri portions. When considering land use and cultural resources, only the St. Clair and Madison County area are be included.

As of 1980, the population of the St. Louis SMSA was 2.3 million, slightly less than the 1970 figure of 2.4 million. The 1980 unemployment rate was below the national average and 1978 per capita income figures were slightly higher than average. Three-fourths of the SMSA population resides on the Missouri side and the remainder in Illinois. The poorer economic condition of the Illinois population is reflected in both a higher unemployment rate and a larger percentage of poor families. During the past decade the population of the Missouri side increased slightly while Illinois' decreased.

Employment rates follow this pattern. The SMSA as a whole experienced an 8% increase in employment in the period between 1973 and 1979, but the individual state components show that the increase occurred in Missouri (25%), while Illinois employment dropped by 34%. The largest decline in jobs occurred in the manufacturing sector, but here again Illinois was harder hit, dropping 18% as opposed to only 8% in Missouri.

The Roles of Transportation in the Local Economy:

The railroad industry plays two important roles in the St. Louis economy. As a key component of the local transportation industry, it provides the infrastructure necessary to move goods from, and within the SMSA. Further, it is a local industry generating jobs and local business. Railroad workers in the SMSA account for 22% of local transportation employment. In 1978, 45,500 people were employed in transportation, accounting for 4.5% of the total SMSA work force.

St. Louis' early position as a transportation center shaped the City's economic development, following a typical pattern: good transportation helps to attract trade establishments which, in turn, help to attract manufacturing plants. This pattern continues to be reflected in the City's current economic structure. The manufacturing, transportation, communications and utilities, and wholesale trade sectors of the St. Louis economy are relatively strong compared with the overall U.S. economic structure.

In addition to its role as a part of the infrastructure, transportation constitutes an important local industry. Over recent years, the rail industry in the SMSA purchased 78% of its inputs locally. Because this proportion of local purchases is relatively high, changes in the size of the transportation industry induce relatively large secondary changes in the local economy. While purchasing many of its inputs locally, the industry sells a substantial portion of its services outside the SMSA, producing about 12% of the area's basic income. Finally, the industry pays wages which are above the SMSA average.

Land Use:

Although the proposed project lies within the SMSA, its primary effects would be localized in the Illinois portion. This area is essentially an urban fringe with some urban concentrations. Substantial blight has occurred throughout the study area.

Area land use patterns (see Exhibit H) have been influenced by three major factors: the Mississippi River, the rail corridors, and highways. The Mississippi River forms the western boundary of the project area and has acted as a natural magnet for industries desiring easy access to its navigable waters. The area's land use has also been influenced to a lesser degree by various features related to the River. Among these are levees, drainage canals, marshes, and lakes. Except for Horseshoe Lake, these features have served to direct land use change on a site-by-site basis rather than for the area as a whole. Horseshoe Lake is part of a 2,100 acre State Recreation Area. Because of its size, Horseshoe Lake serves as an effective barrier, separating development in the Granite City-Madison area from development in East St. Louis, National City, and Fairmont City.

Rail corridor locations, while exerting a major influence of their own, have themselves been influenced by the River. The majority of rail yards are located along the River, from Madison south to Sauget. The bulk of these yards, occupying approximately 1,500 riverfront acres, are currently underutilized. Rail lines fan out in all directions from this central area, and it is along these corridors that most industrial development has taken place.

Highway corridors are similar to rail in that they are concentrated in a single area near the river and then fan out as one moves east. This radial pattern provides good access to the riverfront, but fails to provide for north-south movement parallel to the river. The juxtaposition of the rail and road networks results in numerous rail/highway conflicts.

Land use patterns established during the early part of the century were associated with the development of transportation and the beginnings of an industrial and mining based economy. During the second quarter of the century population and industrial growth began to slow. In the third

quarter, established communities began to experience decentralization. Prior to 1950, residential land use was confined within municipal boundaries and commercial activities were located primarily in Central Business Districts (CDB's). Industrial uses were concentrated close to transportation facilities. Since 1950 the most apparent type of development has been the rapid expansion of residential and commercial uses into areas formerly occupied by agricultural and other rural uses. The dispersal of urban functions away from established urban cores represented an acceleration of the decentralization process. This process can be associated with improved highways and the utilities accompanying them. Commercial activities have also expanded to outlying areas following the residential development, taking advantage of cheaper land and plentiful parking space.

The dominant use in the study area is still "Agricultural" with over half of the acreage falling within this category. The second largest category is "Pasture or Inactive Mine" and the next is "Developed", i.e. residential, industrial, and commercial.

Socio-Economic Characteristics:

Per capita income and transfer payment data indicate that residents of Madison County are economically better off than those living in St. Clair County. In both counties, over one-third of the employed residents work outside the county. The St. Clair County economy is much more dependent on government jobs than is the Madison County economy. In contrast, St. Clair County has a particularly low percentage of manufacturing jobs, while Madison County's dependence on manufacturing is unusually high.

Economic characteristics also vary widely within each county. (See Exhibit B for Minor Civil Divisions.) East St. Louis in St. Clair County is the most depressed part of the area. Compared to St. Louis, East St. Louis had a larger portion of people with incomes below the regional median in 1969, and experienced a higher unemployment rate. The City's plight is perhaps best summarized by the fact that population fell 21.1% in the years between 1970 and 1980. Table 3 compares the two cities.

Demographic Characteristics - Both Madison and St. Clair Counties and their subareas in Illinois have also experienced population losses between 1970 and 1980. The greatest losses occurred in Venice, National City, Alorton, and Brooklyn. Cities which experienced population decreases during both the 1960-1970 and 1970-1980 decades include Venice, Brooklyn, East St. Louis and Centreville, as shown in Table 4, and expanded on in the Technical Supplement entitled Socio-Economic Impact Analysis.

The population of the east side of the St. Louis SMSA is predominantly white but within the potential impact area there is marked variation. Areas with a majority of black population include: East St. Louis, Centreville, Brooklyn, Venice, and Alorton. The majority of the National City population, however, is white.

TABLE 4

POPULATION CHANGE FOR AREAS IN THE
ILLINOIS PORTION OF THE ST. LOUIS SMSA

	1960	PERCENT CHANGE 1960-70	1970	PERCENT CHANGE 1970-80	1980
Madison	224,689	11.7	250,934	- 1.3	247,671
Madison	6,861	9.1	7,482	-20.9	5,915
Venice	5,380	-13.0	4,680	-25.6	3,480
St. Clair County	262,509	8.6	285,176	- 6.9	265,469
Brooklyn	1,922	11.4	1,702	-27.6	1,233
National City	117	6.0	124	-43.5	70
East St. Louis	81,712	-14.3	69,996	-21.1	55,200
Alorton	3,282	8.9	3,573	-37.4	2,237
Centreville[1]	12,550	-10.9	11,378	-14.3	9,747

[1] Adjusted to four major census tracts: 5027, 5027, 5029, and 5030.

Source: U.S. Bureau of the Census, 1980 Census of Population and Housing, Advance Reports, Dept. of Commerce, Illinois Report PHC 80-V-15.

Compared to the general age structure for the St. Louis SMSA, communities in Madison and St. Clair Counties appear to be younger. Only Madison and Alorton have age structures which resemble that of the SMSA. No community has a greater proportion of elderly than the SMSA average.

Economic Characteristics - Labor force participation levels for Madison and St. Clair Counties are similar to those for the SMSA and the Nation. Variations at the subcounty level are more pronounced. Brooklyn, Alorton, and East St. Louis have substantially lower total participation levels, while no municipality has a level of participation greater than either the national or SMSA averages. In Centreville Township, census tract 5026.03 (see Exhibit I for the locations of these tracts) has a substantially higher participation than other areas in the township. Census tracts 5026.04, 5027, and 5028 have significantly lower levels of labor force participation.

Unemployment in the two counties differs significantly from the U.S. and SMSA averages. The highest levels of unemployment, 19.5 and 13.7%, occur in census tracts 5027 and 5028, respectively. The lowest unemployment appears to exist in census tracts 5026.03 and 5026.04. Overall unemployment for the U.S. and the SMSA between 1970 and 1980 has increased by roughly 30%, but for Madison and St. Clair Counties, the rate has increased 93% and 54%, respectively. In general, the municipalities in the study area have high unemployment levels and low labor force participation levels.

While family incomes for the U.S. and the St. Louis SMSA in 1970 averaged $9,816 and $11,868, respectively, incomes varied between $5,000 and $9,000 for most subcounty areas. The lowest family incomes were found in National City, Alorton, Brooklyn, and Centreville (census tract 5027). This pattern is also reflected in the data showing the percent of families with incomes below the Federal Poverty Level. In Centreville, census tract 5027 is particularly depressed with 44% of its families having incomes less than the poverty level. These socio-economic data for the project subareas are more fully discussed in the Socio-Economic Impacts Technical Supplement.

Housing Characteristics - The value of housing, level of rent, and vacancy rates, also shown in the Socioeconomic Technical Supplement, illustrate the relative disadvantages of the study area. Vacancy rates are highest in Alorton, Venice, National City, and Centreville (census tract 5030). Between 1970 and 1980, significant losses in housing stock were experienced in Alorton (-25.2%), Venice (-12.1%), Centreville City (-12.7%) and within Centreville, census tracts 5027 (-34.7%) and 5030 (-15.3%).

The market value of homes in Alorton, Venice, and Brooklyn is noticeably lower than elsewhere in the study area. Additionally, census tracts 5027, 5028, and 5030 in Centreville have low housing values. The lowest rents are paid in Alorton, Venice, National City, and Brooklyn, as well as in Centreville's census tracts 5027 and 5028. On the whole, these data reflect the poor quality of housing in much of St. Clair County, especially in Centreville and Alorton.

Summary - The areas within Madison and St. Clair Counties that will be impacted by the proposed rail restructuring are generally characterized as predominantly black with low family incomes, high family dependency on social security and public assistance payments, substandard housing at very low market value, high unemployment, and low labor force participation levels.

Recreation:

Parks and recreational facilities are normally considered to be those open spaces that are formally developed. These improvements vary in sophistication from those with swimming pools and gyms to those with only dirt baseball fields. The least developed areas are open space, which may or may not be available for recreation uses. Recreational space has become increasingly important in urban life and awareness of its necessity is rising.

Although there is a great deal of vacant land in the study area, only a nominal portion exists in the form of recreational, green belts or public open spaces. The amount available for public use is far below the minimum levels considered by the National Recreation and Park Association to be required for healthy communities. A city the size of East St. should have 150 acres of neighborhood parks and 150 acres of district parks. It is deficient in neighborhood parks, with only 20 acres total. The City does contain sufficient district parks, but several are privately maintained.

Only three other communities in the St. Clair County part of the study area have local park facilities. Robin Stadium Park in Brooklyn features a basketball court, two baseball diamonds and a children's play area. It is the only park administered by the Stites Township Park District. Fairmont City has a four-acre municipal park and Sauget has a 20-acre open area which has not been fully developed. The area's need for "metropolitan" parks, larger open areas at some distance from urban development, is fulfilled by the heavily-used Frank Holten State Park.

The Madison County portion of the study area is somewhat richer in park lands. State parks include a portion of Cahokia Mounds State Park and the entire expanse of the approximately 960 acre Horseshoe Lake State Recreation Area. There is also a nature trail which is classified as a regional park. Both of the municipalities included in the study area, Venice and Madison, have sufficient city parks. In addition, there is a neighborhood park of 6 acres administered by the county.

In sum, the St. Clair County portion of the study area appears to be deficient in local parks, both in East St. Louis and in the surrounding communities. Despite the fact that the study area is filled with abandoned property and vacant land, its recreational facilities do not provide a minimum level of usable open space for its population. The Southwest Illinois Regional Planning Commission, in 1972, inventoried and analyzed park acreage in the area and determined that it contained less than 15% of the park acreage required by minimum standards.

Cultural Resources:

Lying within the American Bottoms region of North America, the project holds the potential for affecting the area's rich cultural resources. Prehistoric remains are particularly abundant in Illinois, with one of the most important being Cahokia, the large mound complex which is all that remains of the earliest "city" in the United States. Cahokia Mounds State Park, a National Register site, is technically outside of the MARGE study area. However, since the investigation of Cahokia using scientific archaeological methods began some three decades ago, numerous satellite settlements have been discovered and related to the mound complex. There is the possibility, therefore, that more of these small sites exist, making the project area an archaeologically sensitive one.

The role of St. Louis as the "Gateway" to America's West also emphasizes the importance of its colonial, or post-European contact, history. Although the settlement of the Illinois side of the River began after St. Louis itself was established, the importance of river crossings promoted the early development of communities on the east side. Starting in 1793 with the first commercial Mississippi River ferry, the association of the area with transportation has continued to the present.

In the early 1800's, the character of the River as a channel for both commerce and communication emphasized the importance of the centrally located St. Louis river harbor, and its preservation was crucial to the continued existence of the settlement. The tendency of the river channel to shift and silt-in was a matter of grave concern to St. Louis merchants and stimulated efforts by the United States Army Corps of Engineers to maintain a clear port. The process, initiated by Lieutenant Robert E. Lee of the Corps, for preventing the blockage of the harbor also resulted in the heavy deposition of river sediments on the Illinois side of the river. The alluvial accumulation eventually added a sizeable land mass, known as "Bloody Island" from its use as a dueling spot, to the eastern shore. By the 1850's, however, it had lost its identity as an island and was platted by the surveyor of St. Clair County, Illinois.

As the railroads entered the Midwest in their drive across the continent, St. Louis' central location again recommended it as an attractive spot for transportation facilities to converge. By 1860 the Illinois community now known as East St. Louis had become a leading railroad town and "Bloody Island" was its center of rail activity.

The construction of the Eads Bridge in 1874 made rail access across the Mississippi possible and reduced dependence on the steam-powered ferry which was previously the only link between East St. Louis and St. Louis. In time, as many as nineteen railroads entered the area from the east and connected to two transfer lines. The fragmentation of social and commercial patterns characteristic of the area today was begun in the late 1860s by the railroad facilities which multiplied on the Illinois Riverfront.

As mentioned previously, the Cahokia Mounds National Register site is outside the project area, except for a one-acre tract in its extreme southwestern corner, where a new rail interlocking (corridor connection) may have some effect. The Eads Bridge, however, is also a National Register property, lying within the study area. The Bridge is a steel arch structure designed and built by James Eads between 1870 and 1874. Its construction represented the first use in America of steel spans longer than 500 feet. Eads also pioneered the use of "caissons" to lower workers below the water to construct the bridge pilings. It was listed on the Register in 1963. The Bridge will not be affected, but potential project impacts on the Cahokia Mounds site are described in the 4-F Discussion (included in this Volume as a separate section).

The suitability of the study area's flat land for industry was enhanced by proximity to Illinois coal fields, the availability of water, and the plentiful dumping space in the sloughs and ponds that dotted the area. The opening of the National Stockyards in 1873 began an industrial boom that lasted into the 1920's, creating abundant employment opportunities, particularly for the unskilled. The concentration of heavy industry resulted in the attraction of an economically homogeneous immigrant population of ethnic white and southern black workers. During this period the large industrial employers, either singly or in groups, began incorporating their plants and some surrounding blocks of company-owned housing in order to escape the tax burdens of established municipalities.

This practice, along with the tax concessions and other favorable treatment of large companies by corrupt politicians, helped to create an atmosphere in which union organization was discouraged and racial tensions promoted by constant threats to replace workers who participated in unions with lower-paid black migrants. Prior to World War II, 16% of the area's population was black. The black residents were forced to live in separate areas, in extremely squalid conditions. These conditions and the discontent they bred led eventually to the major race riot of 1917.

Racial tension and the soiling of the environment by large manufacturing plants made the Metro East area a less desirable place to live. Many business and professional people earned a living there, but built homes elsewhere. The economy of the area became heavily dependent on taverns and gambling houses, a lucrative all-night trade which continued to flourish until World War II.

A cultural resource survey of the project area was conducted under the auspices of the Illinois Archaeology Survey (IAS) in accordance with Heritage Conservation and Recreation Service guidelines for the location and identification of prehistoric, historic and archaeological resources (36 CFR 66). A prehistoric reconnaissance done by an IAS team identified 12 small sites in the vicinity of Gateway Yard, nine of which were recommended for further investigations. An examination at the start of Phase II studies revealed that none of them would be affected by yard construction and they were excluded from further consideration.

Additional archaeological reconnaissance surveys were necessitated in late 1980 by expansions in the restructuring project. Some of the areas yielded no archaeological information, and sites were identified in others. Clearance has been recommended for all grade separation locations and for seven of nine rail interlockings. Further testing will be undertaken as needed to determine significance on sites identified in the Common TOFC yard, the Gateway Yard loop area and the remaining interlockings, after the receipt of archaeological recommendations.

Results of the historic survey conducted by Illinois State University identified a number of sites dating to the late 19th and early 20th centuries. Most of these properties were associated with the development of the railroad industry. Archaeological testing was recommended to determine potential historic significance. Subsequent archaeological investigation has indicated that National Register determination should be requested for the following sites (shown in Exhibit K of this EIS):

Kerr Island - Early settlement established on the Mississippi River in Madison County, Illinois. Kerr Island takes its name from Matthew Kerr, who operated a horse-powered ferry service to transport people and goods across the river. The ferry operation was displaced by the Lee Dike System, but the settlement grew and prospered, despite periodic setbacks. By the time of the construction of McKinley Bridge in 1910, however, most businesses and residents had moved inland to escape periodic floods. The character of the settlement changed as an influx of laborers, particularly rural southern blacks, poured in to man the flourishing local industries. In addition to its early history, Kerr Island documents this migration, which produced a society which has scanty recorded evidence.

National City - An early example of "company housing", this site consists of some 40 houses purchased by the National Stockyards Corporation. National City was incorporated in 1907, ostensibly to control tax rates and property assessments. Local tradition also suggests that the existing houses were on display as model homes at the 1904 St. Louis Exposition.

Illinoistown - The site of the earliest settlement in the East St. Louis area is generally defined as four-block area surrounded by Piggott Avenue, Main Street, Market Avenue and Fifth Street. It was laid out in 1817 and became one of the fastest growing towns in the country by the late 19th century. This growth obliterated most traces of its history before the Civil War and highway construction demolished all but a few structures which date to the late 19th or early 20th century.

Bonnie's Tap Site - Located at the corner of Broadway and Front Streets on the East St. Louis Riverfront, the tavern/restaurant dates to the 19th century. Although it is reputed to have been built 10 years before the Eads Bridge was constructed (1874), the structure itself has been so heavily modified that it would likely not meet National Register criteria. However, occupation levels revealed in testing adjacent to the building hold the potential for contributing to the understanding of settlement and landfilling on "Bloody Island".

Terminal Railroad Roundhouse and Shops - Located at the southeast corner of the village of Brooklyn, this roundhouse complex, which consists of five buildings plus associated track and equipment, was built between 1903 and 1907. The TRRA complex offers an excellent example of early 20th century railroad repair shop construction and machinery that has retained much of its structural and industrial integrity to the present day. The power plant, the two shop buildings, and the oil house are all built of brick. The remaining portion, consisting of eight bays of the once nearly circular roundhouse, appears to be built of corrugated steel panels, although the original was probably constructed of brick. The engine shop is two stories with 15 bays. Steam engines were originally built in this structure and it is still actively used for repair. The significance of the TRRA roundhouse and shops is that it is a relatively intact example of the type of facility used throughout the country to service and repair steam locomotives.

Wabash Roundhouse - The Wabash Roundhouse, later controlled by the Norfolk and Western Railroad, is located at the jog in Illinois Route 3 directly southwest of Brooklyn. Existing remains of the roundhouse complex include one bay of the roundhouse itself, the remaining roundhouse foundations, the turntable, the coal tipple, and associated trackage. The Wabash Roundhouse probably dates to the second or third decade of the 20th Century. Most significantly, the complex contains the area's only intact coal tipple, used to fill the coal cars and the sand reservoirs of the steam locomotives.

Illinoistown Roundhouse - The Illinoistown Roundhouse and Shops complex is located southwest of Piggott Avenue in the southwest corner of Illinoistown. It was associated with the St. Louis, Alton, and Terre Haute Railroad, which was organized in 1862 from the defunct Terre Haute, Alton, and St. Louis Railroad, chartered in 1852. The first roundhouse is depicted on a 1874 facilities map showing all the complex buildings and identifying them as belonging to the Illinois Central Railroad. Between 1915 and 1935 a great many improvements and additions were made and then a phasing out process began. By 1955 most of the structures had been demolished.

The remains of the Illinoistown Roundhouse are significant from a "public awareness" point of view, in that they represent an excellent example of in situ archaeological remains of a type of site (i.e., an early 20th century industrial site) that is generally not afforded much public interest.

City Waterworks - One of the earlier examples of pumping stations in existence in the area is the Waterworks building located at the extreme north end of Front Street in East St. Louis. It consists of two brick structures, one rectangular and one round, that are connected, although it appears that they were not constructed as one unit. The estimated date of construction is between 1874 and 1909. The age of the buildings along with their intact architectural integrity as examples of public utility structures lend them significance.

Summary - A discussion of the proposed project's impact on each of these sites, of the coordination efforts which have taken place, and of how any adverse impacts will be dealt with is included in Chapter IV of this EIS.

Section IV

CHAPTER IV

ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This Chapter discusses the probable environmental impacts of each of the MARGE project alternatives, along with any adverse effects which cannot be avoided and measures to mitigate harm. Each impact area is discussed by alternative, in terms of both long- and short-term (construction-related) effects. Where substantial differences exist between the short- and long-term effects, the two types of impacts will be discussed separately. Measures to be used to mitigate these effects are included in the discussion of each impact area, occasionally separated from the discussion by a subheading, where they are particularly complex. These mitigation measures would be made conditional requirements of project approval. Finally, where the impacts of two or more of the alternatives are similar in extent and nature, they will be described together.

Volume II of this EIS contains figures which are helpful in understanding the discussion. The figure references will be abbreviated as I-1, or IV-3, meaning Figure 1 within Section I, or Figure 3 of Section IV.

RELATIONSHIP OF THE PROJECT TO FEDERAL, STATE AND LOCAL OBJECTIVES

This proposed rail restructuring project, and the riverfront redevelopment it could permit, are compatible with the land use goals and objectives of the planning agencies in the St. Louis area. It has been designated by the East-West Gateway Coordinating Council, the area's A-95 review agency, and MPO, as a key project to be accomplished in the 1980's. Other groups citing rail restructuring as a beneficial planning goal are listed in Table 5.

The project also complements the three federal goals for urban areas, as stated in various pieces of federal legislation. These goals may be summarized as follows:

- The conservation and improvement of existing communities by correcting or modifying conditions of distress, blight or decline

- Increasing housing and employment opportunities and choice for the poor, minorities and disadvantaged

- The promotion of orderly and efficient growth and development which prevent future conditions of distress and conserve existing communities.

TABLE 5

GROUPS WHICH CITE RAIL RESTRUCTURING
AS A BENEFICIAL PLANNING GOAL

1. Illinois Capital Development Board, in "The East St. Louis Area: An Overview of State Capital Projects and Policies," July 1977

2. Consortium of Vocational Educators and Employers, Southwestern Illinois Metropolitan and Regional Planning Commission in "Economic Profile of the Southwestern Illinois Region," Corsortium of Vocational Educators and Employers

3. St. Clair County Overall Economic Development Program Committee, in "Overall Economic Development Program Update 1979-1980" June 1979

4. Southwestern Illinois Metropolitan and Regional Planning Commission

5. East-West Gateway Coordinating Council

6. Office of the Mayor, East St. Louis

7. Office of the Mayor, Centreville

8. National Stockyards Company

9. Office of the Mayor, National City

10. Transportation Study Commission, Illinois General Assembly

11. Economic Development Commission, Illinois General Assembly

12. Regional Commerce and Growth Association, St. Louis, Missouri

NATURAL ENVIRONMENT

Soil and Groundwater Impacts:

- No-Build Alternative - As a first step in the evaluation of the project's impacts, the effects of continuing current conditions was estimated. If the decision was made not to construct any of the Build Alternatives, there would be no impact on the existing prime farmland, except that expected due to urban development. All of the existing prime farmland affected by the Build Alternatives is located contiguous to developed areas, and thus is already under pressure and in risk of conversion to other uses. The fact that the entire project area can be defined as "urban fringe" makes it clear that one impact of the No-Build may well be encroachment of urban activity on these same sites of prime farmland. Further, localized instances of groundwater pollution from railroad sources would probably continue and might increase, depending on traffic levels.

- Two-Yard Alternative - The Madison Yard expansion (Figure I-2) affects approximately 145 acres, 34 of which are classified as prime farmland (8 more than under the Three-Yard plans discussed below). Other than a greater loss of prime farmland, there is no significant difference among the three plans' impacts on Madison Yard. The susceptibility of groundwater pollution during construction for the short term and long term is not considered a threat.

  The farmland impacts of the Two-Yard Plan on Gateway Yard are the same as under the Three-Yard Plans. Some 430 acres will be required and 92 of these are prime farmland currently under cultivation.

- Three-Yard Directional and Bidirectional Alternatives - Extension of the Madison Yard under the Three-Yard Directional and Bidirectional Alternatives will affect 160 acres of land, all of which would eventually become part of New Yard. Approximately 79% of this land is classified by the U.S. Department of Agriculture (USDA), Soil Conservation Service (SCS) as Urban land, consisting of areas covered by buildings and pavement. Only about 25% of this urban land supports vegetation, mostly grass borders and widely spaced trees and shrubs. The susceptibility of the soils to erosion is low mainly due to the fairly level topography. However, during construction when vegetative cover is destroyed by cut and fill operations, considerable amounts of soil may be eroded if appropriate soil conservation measures are not taken to stabilize soils exposed on excessively high slopes. Such measures would be incorporated into the design of project elements. Twenty-six acres of prime farmland will be lost as a result of construction. Most of this land is presently under row-crop production. Table 6 shows the average yield per acre expected of prime farmland. These numbers, multiplied by the losses, give the agricultural production impacts of the entire project.

TABLE 6

AVERAGE YIELDS PER ACRE*
FOR ALL PRIME FARMLAND

	Bushels/acre*	Tons
Corn	135	-
Soybeans	45	-
Wheat	55	-
Oats	73	-
Hay	-	5

* Intensively farmed (i.e. a high degree of management)

Source: Soil Productivity in Illinois, University of Illinois, College of Agriculture, Cooperative Extension Service Circular 1156, April, 1978, Urbana, Illinois.

The New Yard under the Three Yard Directional and Bidirectional Alternatives has similar impacts. It would affect approximately 390 acres of land, including the 160 initially used to expand Madison Yard (as a first construction stage). Approximately 70 percent of the construction area is classified as urban land. However, a substantial amount of cultivated land exists in this area. Eighty acres of land is presently being cultivated for row-crop production and 50 of the 80 acres qualifies as prime farmland. Proper mitigative measures for the control of erosion will be used to reduce the susceptibility of the soils to erosion and the potential for polluting the groundwater.

The Gateway Yard under the Three-Yard Directional and Bidirectional Alternatives has similar impacts. Approximately 440 acres will be affected by constructing the yard. The most significant impact will be the loss of 92 acres of prime agricultural farmland, all of which is presently under row-crop production. Approximately 30 percent of the soils have a high shrink-swell potential and are subject to frequent flooding. These limitations will be addressed by bringing in fill material prior to constructing on these soils.

- TOFC Yard - Construction of the TOFC Yard would take place under all alternatives and would require extensive filling and grading. Karnak is the dominant soil type (62 percent) and has severe limitations for the construction of streets and buildings due to wetness, low strength and a high shrink-swell capacity. The main impact will be a loss of prime farmland totaling 105 acres. All together, some 270 acres (or approximately one half of the TOFC Yard) are presently being cultivated for row-crop production.

  Another concern in this area is the dumping of non-metallic waste in an area along the southern part of the proposed yard. This waste consists mainly of foam and rubber which has a very poor structural stability. If the TOFC Yard is built, portions of this material will have to be excavated and hauled to a licensed landfill.

  The actual excavation of the refuse may have some immediate detrimental impacts on groundwater quality, since at the present time, the characteristics of the refuse are not known. Once the material has been hauled to a licensed landfill, the net long-term impact will likely be the improvement of groundwater quality at the TOFC site. With the exception of the TOFC Yard, none of the alternatives are expected to significantly affect groundwater quality or quantity in either the long term or the short term.

- Interlocking Modifications - Rail to rail connections or interlockings, built where two railroads intersect are referred to by names of letters which identify their locations with respect to rail switching towers. Of the eight to ten new interlockings (see Table 7) to be constructed under all build alternatives, only four would affect prime farmland (a total of less than 20 acres). The NKP-IT Interlocking incorporates 7 acres of cultivated fields, 3 of which are prime farmland.

TABLE 7

INTERLOCKING LOCATIONS

NAME	MAP LOCATION
Lenox Interlocking	Figure II - 4; III-5 (bottom)
40th Street Interlocking	Figure III - 1 (bottom)
NKP Interlockings	Figure III - 3 (bottom)
Valley Junction	Figure IV - 4
Bixby Junction	Figure IV - 6
SD Interlocking	Figure III - 1 (top)
HN Cabin	Figure VII - 2; III - 2 (bottom)
Tolson Interlocking	Figure V - 1
Willows Interlocking	Figure IV - 3 (top)
SH Interlocking	Figure IV - 1, 2 (top)

The other NKP Interlocking incorporates a small portion of prime farmland (less than 1 acre).

Improvements to Bixby Junction would affect 6 acres of prime farmland now under row-crop production. At present, 1 acre has already been affected by the construction of new Interstate 270. HN Cabin Interlock involves the loss of 5.6 acres of prime farmland presently under grass vegetation. Tolson, Willows WR, SO and SH Interlockings do not affect any prime farmland.

- Route 3 Relocation - The relocation of Route 3 would be implemented under any of the build alternatives. Three variations have been proposed for relocating the highway, differing in their alignment with respect to Q Rail Corridor, on the east or the west side of the corridor or split with one or two traffic lanes on each side of the corridor. The Technical Supplement entitled Relocation of Route 3 provides more details. Exhibits F1, F2, and G depict the alignments. All three Plans involve the loss of 6 acres of prime farmland.

- Corridor Additions - Corridor improvements and additions will extend for considerable distances at various locations within the study area. These lengths of track traverse a number of different soil types. The main impact will be the loss of narrow strips of farmland parallelling the existing tracks.

- Grade Separations - The soil and groundwater effects of constructing the nine to eleven grade separations are minimal. Further, the fact that nine of the locations are the same for all four alternatives, eliminates the impact distinctions among them.

- Summary - The amount of prime farmland lost due to construction or expansion of railroad yards, interlockings, and Route 3 relocation varies from 250 to 300 acres (not including prime farmland lost by corridor additions). Two-thirds of these acres are situated adjacent to urban areas and are susceptible to continuing development. The construction of new rail facilities in unincorporated areas is not expected to encourage development beyond the rail limits. The provisions of the U.S. Department of Transportation's "Policy Statement on Transportation and Agricultural Lands," signed January 5, 1981, will be followed in the finalization of this EIS.

Approximately 1300 acres of land in total would be directly affected by construction. With the exception of the area being filled in at the TOFC Yard, none of the construction sites are expected to affect the quality or quantity of the groundwater within the project area in either the short or long term.

Although not quantifiable, the susceptibility of the soils to erosion during construction is a potential impact which would be overcome by following erosion and sediment pollution control procedures in order to protect the surrounding farmland. Staged grading and revegetation would be planned so that a minimum of soil surface is exposed at any one time. This would be included in construction contracts. Soil related construction problems would be minimized by filling and ballasting before building begins.

Flood Hazards and Flood Plain Management:

- No-Build - The No-Build Alternative would have no impact on the existing storm water or flood plain management systems in the project area. Localized sites of shallow, interior flooding would continue in the areas illustrated in the Technical Supplement entitled Natural Systems Impacts (Exhibit C). It should be noted that much of the project area is a floodplain, subject to this shallow, interior flodding or ponding.

- Two-Yard, Three-Yard Directional and Bidirectional Plans - Possible floodplain encroachment resulting from project construction was examined using the U.S. Department of Housing and Urban Development floodplain maps as discussed in the Technical Supplement entitled Natural Systems Impacts. Since all rail facilities are currently located in the floodplain, improvements will obviously also take place with areas susceptible to flooding. Therefore, all regulations governing construction in floodplains will be observed, and compliance with DOT Order 5650.2, Floodplain Management, will be maintained. Coordination with the U.S. Army Corps of Engineers was initiated during the scoping process and has continued during the assessment of flood hazards.

  The impacts on the floodplain resulting from any of the build alternatives would be similar. Short term impacts due to construction activity should not occur if sediment and debris are kept from accumulating in the area's drainage system, as planned. If it did occur, the water-carrying capacity of the ditches and canals would be reduced, further aggravating the interior flooding problem. Adequate erosion control measures would be implemented during the construction phase.

  Several components of the area's drainage system would be modified by the project. The culvert section of the Cahokia Canal in the vicinity of National City would be relocated under either of the Three-Yard Alternatives. Harding Ditch would be bridged by Gateway Yard expansion and the proposed ICRR ditch in Centreville would have to be redesigned to accommodate the expansion under all build alternatives. Schoenberger Creek would be rerouted on the west side of the TOFC facility. All of these and any other changes to the drainage system would provide adequate capacity for design year storm flows, subject to review by the U.S. Army Corps of Engineers.

The new and expanded rail yards would be constructed partially in areas of 100 year shallow flooding under each build alternative, encroaching on approximately 60 acres under the Two-Yard, and 70 acres for each of the Three-Yard Plans. These areas are located in Centreville where the Gateway Yard would be expanded, and at surrounding areas of Brooklyn where the New Yard or expanded Madison Yard are proposed. Floodplain areas affected at the TOFC Yard site amount to approximately 120 acres.

Any yard construction would involve the filling of portions of the floodplain, reducing the land available for the storage of excess water during major floods. This excess water would then flood areas adjacent to the present floodplains. The people and property of Brooklyn and Centreville currently not subject to flooding could be impacted under all build alternatives, although this impact is expected to be minimal. The project is designed to minimize the filling of the floodplain wherever possible. Further, the incorporation of new drainage facilities, as approved by the U.S. Army Corps of Engineers, with the engineering design of the yards will lessen the flooding impacts. Finally, the proposed ICRR ditch (see the Natural System Technical Supplement) will greatly improve drainage in Centreville.

Water Quality:

- No-Build - The short-term and long-term impacts of the No-Build Alternative on the area's water quality would be minor. Runoff of oil and fuels from rail operations, as well as de-icing agents and herbicides from rail line maintenance, would continue in localized areas. The amount of operations-related pollutants entering area surface and ground waters would increase in proportion to the increase in the volume of railroad traffic.

- Two-Yard, Three-Yard Directional and Three-Yard Directional - The water quality impacts from all build alternatives would be similar and they are, therefore, discussed together. Each of the alternatives would affect various elements of the water resource system. A detailed discussion can be found in the Natural Systems Analysis Technical Supplement.

  Repair and maintenance functions associated with yard operations can affect water quality. All locomotive engine repair and car maintenance facilities within new or expanded facilities would be serviced by a waste water collection system which could treat any fuel spills, oil leakage or other rail-generated pollutant before discharge.

  The potential for chemical spills exists for any yard facility and with it the possibility of contaminating the area's shallow alluvial aquifer. The nature of the spill would determine the speed with which it was absorbed into the ground water system. Industrial wells located throughout the aquifer could be affected. Plans to control accidental spills would be developed and implemented through the new fire and emergency stations to be built as part of Gateway/New Yards.

- TOFC Yard - Long-term impacts on water quality due to the TOFC yard operation would be restricted to pollutant runoff into nearby drainage channels. Fuels, oils, chemical spills and the de-icers and herbicides used in yard maintenance would be concentrated in the runoff and could produce a localized, severe impact on the receiving stream as there is no pre-treatment possible to reduce the damage.

- Corridor/Interlocking Modifications - Of the proposed corridor improvements, none should negatively affect water quality during or operation over the long term. Several may impact water quality during construction only, and these are discussed later in this section. Some may, after construction, even reduce pollutants (such as oil, grease and fuels) due to increased switching efficiency, fewer trains, and reduced delay.

- Grade Separations - No impacts on water quality have been found to result from constructing grade separations.

- Route 3 Relocation - Water quality impacts due to relocating Route 3 would be confined to highway runoff during normal use.

- Construction Impacts - Short-term impacts would occur in any water body within the project area located near construction activities. Erosion and the resultant silt deposition in the stream channels would probably occur during any significant rainfall. Impact on water of affected streams include sedimentation, increased turbidity, and nutrient release (nitrate and phosphate). In addition, heavy construction equipment would leak fuels, oil, grease and other organic chemicals during normal operations. These and any accidental spills during construction would flushed into nearby streams, especially during rainfall.

  At the northern end of the project area, expanded Madison and New Yard would involve construction close to sections of Cahokia Canal, creating short-term impacts. Maintaining the flow of the Canal would require relocation or diversion underground. Expanding Gateway Yard, at the southern end, would involve constructing track over a section of Harding Ditch. Maintaining the ditch would require bridging the tracks over it, channeling it underground or rerouting it. Any yard construction would create short-term impacts similar to those described above. Approximately one-half mile of Harding Ditch/Canal No. 1 system and right-of-way would be affected by this construction.

  The proposed TOFC yard would completely cover the downstream channelized section of Schoenberger Creek. This portion of the creek would have to be rerouted or channeled underground. Actual construction impacts on hydrology and water quality of this section of the creek and to Cahokia Canal would probably be restricted to this diversion.

Of the proposed corridor improvements considered in the project, only the A&S Corridor addition and the NKP Interlocking modification could present water quality impacts. The A&S Corridor addition is located near the headwaters of Shoenberger Creek, east of Washington Park, in a wetland area. Construction of an additional mainline in this area could lead to erosion and sedimentation in the creek. Several lakes in Holten State Park could also be adversely affected by sedimentation from the construction of the additional mainline. The NKP Interlocking is located on the west side of Horseshoe Lake and short term construction impacts could affect the lake.

Short-term impacts on water quality due to the relocation of Illinois Route 3 would be construction related, affecting the western tip of Horseshoe Lake and a small lagoon which receives the process water discharged from Union Electric's Venice Power Plant. Long-term water quality impacts of the highway during normal use would include highway runoff.

Measures required by the Illinois Department of Transportation to control erosion during construction would minimize water quality impacts on the affected streams. These measures could be expected to retain most of the solids that would otherwise enter the waterways (IDOT Water Quality Manual, 1977). These measures should be considered during the final engineering design and implemented during construction.

Impacts to Natural Ecological Systems

- No Build Alternative - The impacts of the No-Build Alternative will be dependent on which of the two most probable general development scenarios for the project (Exhibit E, attached) area occurs - continued urbanization and industrialization or, increased abandonment of lands. Under the first set of conditions, there would be a gradual loss of habitat by encroaching urbanization and industrialization, with a lack of mitigation. Much of the area which is presently undeveloped is in low-lying areas or in the Mississippi River floodplain. Since those areas also represent the principal remnants of sensitive wetland habitats in the project area, they would be gradually degraded by increased disturbance through are a development. Thus, the number, dimension, and carrying capacity of habitats which have the highest potential for maintaining threatened and endangered species would gradually decrease. Under the alternate scenario of land abandonment, the proportion of vacant or "old field" habitats would increase, while little change in other habitat types would occur.

- Two Yard Alternative - Impacts involved in the expansion of Madison Yard under this alternative include partial or complete loss of approximately 35 acres of cultivated fields, 55 acres of old field habitat, and 5 acres of urban area. Table 8 summarizes these impacts. Each alternative sum includes the common elements described above, i.e. the Common TOFC Yard and new interlockings. The variety of floral and faunal types inhabiting these areas is limited by the size of the available habitats and high degree of human disturbance in the area. No sensitive areas are to be incorporated into this alternative for the Madison Yard.

TABLE 8
TOTAL DIMENSIONS OF HABITATS INCORPORATED INTO CONSTRUCTION UNDER EACH ALTERNATIVE
(Acres)

Alternatives	Cultivated Field	Old Field	Urban	Lentic (Lake)	Lotic (Stream)	Wetland
No Build	0	0	0	0	0	0
Two-Yard	256.4	243.9	142.7		3.5	65.7
Three-Yard Directional	330.3	678.3	184.6		5.4	65.7
Three-Yard Bidirectional	325.7	674.9	227		5.4	64.1
Route 3 Relocation						
1	10.5	8.2	9.5			0.5
2	10.5	3.1	9.5	0.3		0.5

The impacts of construction of the Gateway Yard under the Two Yard Alternative will include effects on approximately 97 acres of cultivated field, 240 acres of old field, and 74 acres of urban habitats. The floral and faunal components of these habitats are limited by habitat size and degree of human disturbance and construction impacts are similar to those discussed for the Madison Yard. The 700 feet of stream habitat (Harding Ditch) affected will undergo short-term impacts of increased turbidity and disruption and long-term impacts include partial loss of riparian and aquatic habitat. The wetlands to be incorporated into the construction area include a dead end arm of Harding Ditch and low-lying areas surrounded by old field; approximately 4 acres will be involved. The short term impacts to these areas will be siltation, disruption and partial filling. The long term impacts will be a partial loss of these wetland habitats.

- Three-Yard Directional - The treatment of Madison Yard is the same under both Three-Yard alternatives. The dimensions and impacts to cultivated and old field habitats are approximately the same as under the Two-Yard Alternative, but these will ultimately be part of the New Yard to be built in the Three-Yard Plans. The construction of New Yard next to Madison Yard will involve under the Three-Yard Directional Alternative, approximately 81 acres of cultivated fields, 138 acres of old fields, and 27 acres of urban area would be disrupted or lost. In addition, approximately 3,100 feet of the Cahokia Canal would be altered. Short term impacts will include disruption, siltation and temporary loss of aquatic and riparian habitat. Long-term impacts will be negligible with mitigation.

  Gateway Yard area effects related to the Three-Yard Directional Alternative will be same as those under the Two Yard Alternative.

- Three-Yard Bidirectional - The impacts to cultivated and old field habitats in the area Madison Yard are similar under both Three-Yard alternatives. The construction of New Yard under the Three-Yard Bidirectional Alternative, will incorporate approximately three less acres of cultivated field and forty-five more acres of urban habitat than is included in the Three-Yard Directional Plan. The general dimensions, locations and impacts for all the habitats discussed under the Three-Yard Directional Alternative will remain the same under this alternative.

  Under the Three-Yard Bidirectional Alternative, there will be two less acres of cultivated field, four less acres of old field, five less acres of urban and 1.6 less acres of wetland habitats incorporated into the construction of the expanded Gateway Yard than in the Two-Yard Alternative.

- TOFC Yard - The impacts of construction of the TOFC Yard are the most ecologically significant of all construction sites. The habitats involved include 57 acres of wetland, one and one-third miles of stream (Shoenberger Creek), and 190 acres of old fields. There will be a complete loss of wetlands due to filling for the rail yard and TOFC parking lot.

Schoenberger Creek bisects the yard in a north-south direction. There will be a complete loss of this stream habitat as a result of enclosing the stream in a large culvert. Short term impacts will include a temporary disruption and loss of stream habitat. The cultivated field and old field habitats which would be affected are similar in floral and faunal composition to the Madison Yard.

The loss of habitats has been discussed with appropriate agencies and would be mitigated in a manner agreed upon by the Illinois Department of Conservation, the United States Department of the Interior's Fish and Wildlife Service, the U.S. Army Corps of Engineers and the Illinois Department of Transportation. Possible measures include the purchase of similar habitats in a ratio to be defined by agreement. Properties to be purchased under such a plan would be located within the project area so as to be available to mobile organisms displaced by construction. A second type of mitigation would involve the protection, revegetation and overall enhancement of habitats affected by construction. Specifications for these measures are included in the Natural Systems Technical Supplement to this document.

- Corridor Additions - The impacts of the construction of corridor additions is the complete loss of habitat directly adjacent to one side of the existing tracks and disruption and erosion into connecting habitats by construction traffic and exavation. Cultivated fields, old fields and urban habitat will be the types affected, for the most part. Some small wetland areas will also be affected; short-term impacts include disruption and increased water turbidity. Long term impacts will include a partial loss of the total wetland areas with construction. In areas where wetlands are encroached upon, proper mitigative measures will insure that the adjacent wetlands are not significantly affected by sedimentation.

- Interlocking Modifications - The construction of interlocking modifications will also affect cultivated fields, old field, urban and wetland habitats. These interlockings vary in length with the distance between tracks they are going to connect. There will be a complete loss of cultivated field in the interlockings. However, the amount of old field within these interlockings will increase as a result. Two interlocings would impact wetland areas (less than 5 acres in total). The 40th Street Interlocking will affect 1.5 acres of wetlands. Proper mitigative measures can insure against excess erosion and subsequent sedimentation of the adjacent wetland. A small portion of Horseshoe Lake (0.2 acres) is incorporated into the construction area. The slope of the land adjacent to Horseshoe Lake is approximately 5 percent. During construction activities, proper control measures must be utilized to avoid erosion of the land. At NKP Interlocking, the most significant impact would be the loss of a small area of wetland, part of which is presently being filled with rock and gravel.

- Route 3 Relocation - The impacts of construction of the Route 3 relocation were assessed under all three alternatives. All involve construction of 2-lane roads with expansion to 4-lane roads with median strips and berms. The construction of the East or Split Plans (Figures F1 and F2 attached) would result in the total loss of approximately 10.5 acres cultivated fields, 8.2 acres of old fields, 9.5 acres of urban acres and .5 acres of wetland habitats. The wetland area affected is a small section of the southwest corner of the Horseshoe Lake system. This wetland area is presently dry with few remnants of wetland vegetation. With proper mitigation the remaining wetland could be enhanced through revegetation.

  The West Plan for the Route 3 relocation (Figure G) involves the loss of the same habitats as the others with an additional loss of 0.3 acres of surface water. The surface waters are part of a 4 acre system adjoining the west side of Madison Yard. This area contains typical wetland and aquatic vegetational forms. The evidence of fauna encountered during site reconnaissance revealed them to be highly mobile or migratory, e.g., muskrats and waterfowl. The short-term impacts to this surface water, by construction, would be siltation and increased turbidity. The long-term impacts would involve a partial loss of habitat. However, mobile wildlife forms would have access to the remainder of the area and with proper mitigation, the ecological value of the area would be enhanced.

- Summary - As shown in Table 8, the total cultivated field habitat to be taken ranges from 256 to 330 acres, old field habitat from 244 to 678 and urban from 143 to 227 acres. Sensitive habitats (wetlands) within the study area are relatively small and interdispersed in this heavily urbanized and industrialized section of the American Bottoms. Each area has been assessed through the literature, site reconnaissance and interaction with various state and federal agencies. The sensitive ecosystems associated with corridor alterations and interlocking modifications total less than 3 acres in size. Many were formed by borrow operations for previous construction and consists of small depressions with poorly drained soils. Wetlands associated with rail yards are similar and of limited value to wildlife through a lack of vegetational diversity. These areas amount to some 60 acres.

  The area proposed for the TOFC facility is the largest of the sensitive habitats, and will be completely lost. This area contains approximately 57 acres of wetland, presently used as a landfill for non-metallic automobile scrap. Since the water quality of the area is poor now, standards project construction would actually improve conditions. The loss of wetland habitat would be mitigated in one of the ways discussed above. Construction within most of the sensitive upland habitats harboring endangered species will culminate in partial loss. However, in most cases, there is sufficient adjoining habitat of the same type available for these species to relocate.

The lentic and lotic habitats to be incorporated into construction have the least potential for harboring threatened or endangered species due to their small size, water and habitat quality, and geographical location. The exception is the Mississippi River, which might suffer short-term impacts due to replacement of the river spans on Merchants Bridge. However, impacts to species within the river environment is negligible due to the magnitude of the river system.

There were no threatened or endangered species encountered during any field reconnaissance and there are no species in these two categories, state or federal, which are indigenous only to the project area. Therefore, there are no data indicating that project implementation will cause extirpation of any species of flora or fauna. A final biological assesment is being performed in consultation with the Fish and Wildlife Service and the Illinois Department of Conservation to confirm these findings.

Erosion controls would be implemented to protect area streams and wetlands. These would follow Department of Transportation guidelines for highway construction, particularly in areas with steep relief or in close proximity to surface waters. Actions requiring large amounts of fill material will be conducted according to the IDOT guidelines and engineering specifications for selection and application. Further, DOT Order 5660.1A on Wetlands and Executive Order 11990, "Protection of Wetlands," will be followed to assure the preservation of sensitive wetland hatitats adjacent to project construction.

Air Quality:

Calculations were made to determine the total area-wide (macroscale) increase or decrease in pollutant emissions from moving locomotives, for each project alternative. Total emissions are dependent on several factors, including the number of trains operating each day, the locomotives in each train (assumed to be three), the train speed (and hence, the horsepower developed by each locomotive), the load being hauled by each train, and the total running time of each locomotive. Pollutant emissions from locomotives are directly proportional to horsepower-hours. The air quality analysis was based on a projected significant increase in average locomotive running speeds for any of the build alternatives. Locomotives were assumed to average 2590 horsepower as opposed to the 1,980 horsepower figure developed for the current situation. The increase in horsepower in itself would result in an increase in pollutant emissions, however, because of the significant increase in average speed resulting from any of the build alternatives, the total emissions will decrease.

- No-Build - Total locomotive emissions in 2000 are projected to increase by 50%. This increase is judged to result in a negligible impact on regional air quality with respect to particulates (TSP), carbon monoxide (CO) and sulfur oxides (SO_2). The increase in hydrocarbons and oxides of nitrogen could result in a slightly adverse effect on photochemical oxidant concentrations in the project area and even downwind of the area, as a result of chemical transformations involving these pollutants.

- Two-Yard, Three-Yard Directional and Bidirectional - Selection of any of the build alternatives would result in approximately 45% fewer pollutant emissions in the Year 2000 compared with the No-Build Alternative. The impact on regional air quality would likely be negligible with respect to CO, TSP, and SO_2, and might contribute to a minor improvement in regional photochemical oxidant concentrations.

  Air quality impacts in the immediate vicinity of rail facilities were also evaluated and the computations indicate that downwind pollutant concentrations resulting from passage of a train operating at full throttle are negligible. The pollutant concentrations at the receptor would increase momentarily, but the effects would not be of sufficient duration to significantly affect concentration over the pertinent averaging times (1 hour, 3 hour, 8 hour, 24 hour, and annual means). In the case of 10 locomotives idling in a yard for 1 hour, pollutant concentrations 100 meters downwind could possibly approach the standard for hydrocarbons (160 mg/m^3, three hour average). This would occur only under abnormally steady winds from a single direction over a three-hour time period. The hydrocarbon standard primarily serves to limit chemical transformation of hydrocarbons and other pollutants to photochemical oxidants.

- TOFC Yard - The construction of the proposed TOFC yard would result in an increase in heavy-duty vehicular traffic at the entrance to the yard. Because the number of vehicles entering and leaving the yard is expected to be relatively low, however, there would be only a minor increase in pollutant concentrations at this location compared with existing levels.

- Relocation of Route 3 - The proposed relocation and improvement of Illinois Route 3 would result in reductions in automotive emissions by increasing the average speed and eliminating intersections where traffic may be stopped by railroad traffic.

- Grade Separations- Grade crossing improvements under consideration at several highway/railroad intersections would facilitate the smooth flow of traffic, insure higher average speeds through the intersections, and eliminate the queuing of the vehicles currently caused by train traffic. Although these structures cannot be considered solely on the basis of their air quality benefits, these should be included when evaluating their cost-effectiveness. The inspection/maintenance program which has already been proposed would also serve to lower automotive emissions in the area. In the Year 2000, regardless of which alternative is selected, most intersections in the project area will experience a decrease in CO concentrations, due to substantially lower average vehicular emission rates and the proposed automobile inspection/maintenance program for the Metro-East area. Therefore, air quality impacts of grade separations would be minimal.

- Construction Air Quality Impacts - During construction and dismantling activities, exhaust emissions from construction equipment and vehicles would occur, and dust would be raised by construction and earth-moving operations. The magnitude of air quality impacts resulting from exhaust emissions would be low, limited to the immediate area, and insufficient to cause violation of the air quality standards. The effects of dust raised through construction activities depend on the efficacy of possible mitigation.

  Two methods of reducing damage to air quality are restrictions on the times that heavy-duty diesel-powered vehicles could use certain routes, and increased attention to minimizing emissions of idling locomotives by proper and regular maintenance, or, if necessary, retrofitting them with pollution control devices. The emissions from construction vehicles would be of too small a magnitude to require mitigation. Dust from construction operations can be controlled through the use of mats, sodding, and planting, as well as through frequent sprinkling with water on dry, windy days.

Noise Pollution Impacts:

In order to assess the long-term noise impacts, the L_{dn} noise levels at individual residences, churches, and schools were predicted for each alternative of the proposed project. The selected residences were the worst case receptors (those that would likely receive the greatest noise impacts from railroad sources). In addition, the number of residences exposed to railroad-generated noise levels greater than an L_{dn} of 65 dBA were estimated for each alternative.

Table 9 lists the estimated number of residences impacted along with the predicted L_{dn} noise levels for the worst case residential receptors. The methodologies used for impact analysis and the detailed results are documented in the Noise Impact Analysis Technical Supplement.

For a residential area typical of those in the project area with an L_{dn} in the 55 to 60 dBA range, a change of 10 dBA would be a major impact, and a change of 5 dBA would be minor. A difference of 10 dBA would make a sound seem twice or half as loud, while a change of 3 to 4 dBA over a period of time would be seldom noticed.

Mitigation measures to reduce the noise impacts of the project include the construction of earth berms or noise barriers of fiberglass or other absorptive material. An alternative to these methods is the use of open space or landscaping between the noise source and the receptor. The discussion of the impacts of the various restructuring alternatives also provides suggested mitigation and its effects. It is assumed that these mitigation measures would be implemented by the railroad undertaking the facility improvements for whatever alternative is selected. It should be noted that the noise impacts of rail corridor operations are not regulated. Noise emissions from some types of rail equipment are regulated (see Chapter III), and standards have been proposed for rail yards.

TABLE 9
SUMMARY OF NOISE IMPACTS

Community	Railroad Source	Estimated Number of Residences Exposed to Railroad Generated Noise Levels Greater than L_{dn} = 65 dBA: 1979 Existing	No Build	2 Yard	3 Yard Directional	3 Yard Bidirectional	Predicted L_{dn} (dBA) Noise Levels For Worst Case Residential Receptors: 1979 Existing	No Build	2 Yard	3 Yard Directional	3 Yard Bidirectional
Granite City & Mitchell	Q Corridor	141	70	74	74	136	69	68	68	68	69
	A&S Corridor	25	22	15	15	19	70	69	66	66	68
North Venice	Merthants Bridge	5	6	0	0	0	62	62	62	65	65
	Q Corridor	30	25	36	40	40	72	72	73	73	74
	Willows Corridor	0	0	0	0	0	54	54	61	64	64
Madison	Willows Corridor	28	26	56	113	118	77	77	75	77	78
Venice	Madison Yard	6	14	0	0	0	66	67	61	60	60
	Q Corridor	17	14	20	21	21	73	73	74	74	75
	Merchants Bridge	53	67	11	5	5	76	77	69	68	69
Venice Township	Madison Yard	0	0	0	0	0	57	57	57	57	57
Brooklyn	Madison Yard	0	11	0	0	0	64	65	63	62	62
National City	Madison Yard	0	0	0	(a)	(a)	57	57	64	(a)	(a)
East St. Louis	Q Corridor	60	60	85	85	60	66	67	69	69	67
	MacArthur Bridge	260	360	260	260	330	79	81	79	79	80
	Willows Corridor	180	160	98	98	56	82	79	77	77	72
	Rose Lake	20	31	70	63	56	65	69	75	74	73
	A&S Corridor	254	112	65	65	60	83	80	74	74	73
Fairmont City, Alorton, & Washington Park	Rose Lake	0	0	0	8	8	66	67	68	69	69
	A&S Corridor	147	131	52	52	52	81	80	77	76	76
East St. Louis	Gateway Yard & MacArthur Approach	46	90	24	33	28	70	72	66	67	66
East St. Louis	Gateway Yard	27	49	80	90	58	70	70	72	73	72
Centreville	Gateway Yard	0	0	0	0	0	57	57	61	61	61
Cahokia, Dupo & East Carondelet	Willows Corridor	281	335	304	329	362	80	81	81	81	62
	Dupo By-Pass	4	4	47	55	34	66	67	76	77	75
Total Number of Residences Under Each Alternative		1,584	1,587	1,297	1,409	1,443					

NOTES: (a) to be relocated under this alternative.

- No-Build Alternative - Railroad noise levels would change little by the Year 2000 if no action were taken. Approximately the same number of residences would be affected as were in 1979, but the noise levels would be slightly higher. The communities affected the most would continue to be Granite City, East St. Louis, Alorton, Dupo and Cahokia. The number of residences impacted would decrease (as traffic is concentrated) in Granite City, while they would increase in Cahokia and Venice.

  The noise levels would differ by 1-4 dBA at most receptors, a change that would not be noticed by most residents over a period of time.

- Two-Yard Alternative - The proposed Two-Yard Alternative would reduce by 18% the total number of residences exposed to railroad-generated noise of over 65 dBA L_{dn}. The overall reduction would be a result of the increased efficiency of corridor traffic routing and of the noise barriers to be constructed under the proposed project. The greater efficiency would decrease the number of trains per day on many corridor segments, resulting in a lower average daily noise level. Those residential areas along corridors that would experience positive impacts are in Granite City, Alorton, Washington Park, and East St. Louis. The L_{dn} noise levels would decrease by 1-7 dBA at worst case receptors within those communities.

  However, the noise levels would increase by 6-14 dBA at residental receptors along the Dupo By-Pass in Dupo and East Carondelet. Over 100 additional residences would be affected by noise levels greater than an L_{dn} of 65 dBA.

  Noise barriers and landscaping are proposed for the areas of Venice, Brooklyn, East St. Louis, National City, and Centreville that are adjacent to the expanded Madison and Gateway Yards. Combination berms and walls would lower noise levels by as much as 10 dBA, mitigating noise impacts to comply with the proposed USEPA property line standard of 65 dBA L_{dn} for rail yards, and with the existing IEPA standards. Barriers would be built around the master and group retarders to meet current retarder standards, but no mitigation is proposed for residential areas along the corridors. Noise levels in Venice and Brooklyn along the Madison Yard would be reduced by 2 to 8 dBA from the existing noise levels by providing barriers and landscaping.

- Three-Yard Directional Alternative - The number of residences exposed to railroad generated noise levels greater than an L_{dn} of 65 dBA would decrease from approximately 1584 to 1409 (11%) within the project area. Improvements in mainline traffic routing and the construction of noise barriers would reduce the overall impacts. The noise level reductions would be in areas of Alorton, East St. Louis, Venice, Brooklyn, and Washington Park, while the noise levels would increase in portions of East Carondelet, Dupo, Cahokia, Madison, and East St. Louis.

The noise levels at receptors along the A&S Corridor in East St. Louis, Alorton, and Washington Park would decrease by as much as 10 dBA. Noise levels would be reduced from 76 to 68 dBA L_{dn} south of the Merchants Bridge Corridor in Venice. Those areas of East St. Louis along the Willows Corridor would experience noise reductions ranging from 1 to 6 dBA.

However, the noise levels would increase along several corridors because of increased rail traffic. The number of impacted residences in Madison along the Willows Corridor and the New Yard hump lead would increase from approximately 28 to 113. The noise levels in East St. Louis along the Rose Lake Corridor would increase by up to 9 dBA, and the noise levels in Cahokia, Dupo, and East Carondelet would increase by 11 dBA at the worst case receptors along the Dupo ByPass corridor.

Noise barriers and landscaping are proposed for residential areas of Brooklyn, Venice, East St. Louis, and Centreville adjacent to proposed yard expansions. (It should be noted that New Yard would be separated from populated areas by the expanded Madison Yard. It is the latter's noise impacts which are shown in Table 8 and discussed here.) Absorptive barriers would be built around the master and group retarders in order to meet current standards. Combination berms and walls would be constructed along yard boundaries. No mitigation is proposed for the corridors.

Mitigation would lower noise levels by 5 to 10 dBA below the levels expected without barriers. Overall noise levels for the worst case receptors in Centreville along the expanded Gateway Yard would increase from 57 to 61 dBA L_{dn} with the barriers. Noise levels in Venice and Brooklyn adjacent to the yard areas would decrease by as much as 7 dBA from the current noise levels.

- Three-Yard Bidirectional Alternative - The proposed Three-Yard Bidirectional Alternative would reduce by 9% the number of residences that are exposed to railroad generated noise levels greater than an L_{dn} of 65 dBA. The reductions would be in the residential areas of Venice, East St. Louis, Alorton, and Washington Park. As with the other changes in noise levels expected elsewhere, these reductions would be caused by a rerouting of train traffic under this alternative, and by a reduction in the number of cars which must be "cross-hauled", i.e. transferred from one rail yard to another.

Noise levels would decrease by 5 to 10 dBA along the A&S Corridor in East St. Louis, Alorton, and Washington Park. Residences in East St. Louis along the Willows Corridor would experience noise reductions up to 10 dBA. Noise levels in the area of Venice south of the Merchants Bridge Corridor would decrease by 7 dBA.

The number of residences impacted would increase in areas of Madison and East Carondelet. Noise levels would increase by 9 dBA in East Carondelet along the Dupo By-Pass. The number of residences exposed to railroad-generated noise in Madison along the Willows Corridor and New Yard Hump leads would also increase.

Residential areas of Venice, Brooklyn, East St. Louis and Centreville adjacent to yard expansions would be exposed to increased railroad noise. Noise barriers and landscaping would lower noise levels by 5 to 10 dBA. Combination berms and walls would be constructed at yard boundaries and barriers would be built around retarders. Again, no mitigation is proposed for the corridors. Decreases of 1 to 7 dBA in the noise levels in areas of Brooklyn and Venice would result from the construction of noise barriers along the Madison and New Yards. The noise barriers would also mitigate the impacts in Centreville next to the expanded Gateway Yard.

- TOFC Yard - There would be no noise pollution impacts associated with this project element.

- Route 3 Relocation - The segment of Route 3 north of Interstate 55/70 through Venice would be relocated under each of the three build alternatives in order to bypass the expanded Madison or New Yards. The average daily traffic (ADT) on this section of Route 3 currently ranges between 4,700 and 6,600 vehicles per day. Traffic is expected to increase to 12,000 - 13,000 vehicles by the year 2000. Three design plans have been evaluated for relocating Route 3 - the East Plan, the West Plan and the Split Plan (Figures F1, F2, and G, attached). All three have been designed to be expandable in order to handle 15,000 vehicles per day to insure adequate capacity beyond the target year. The Technical Supplement entitled Relocation of Illinois Route 3 should be consulted for more details on this topic.

Noise levels were predicted at four receptor sites using the FHWA's Highway Traffic Noise Prediction Model, as described in Federal-Aid Highway Program Manual, Volume 7, Chapter 7, Section 3 (FHPM 7-7-3). The model predicts noise levels based on the peak hourly traffic volume.

The noise levels at all existing residences in National City would decrease by up to 21 dBA under all three design alternatives since Route 3 would be relocated approximately 1000 feet away from the town. The noise levels in Brooklyn would exceed acceptable levels if the East Plan or the Split Plan were constructed, or if Route 3 remained in its current location and the No-Build Restructuring Alternative were selected. The West Plan would lower noise levels by 5 dBA to an L_{eq} of 66 dBA, since Route 3 would be located some 300 feet further from the residential area of Brooklyn. The noise levels in Venice along the existing Route 3 would decrease by 14-16 dBA under all three designs.

The noise levels in western Venice along 2nd Street would increase by 11-13 dBA under all three alternatives. The noise levels under the West Plan would be slightly lower, since Route 3 would be relocated at a greater distance from most of the town's residences.

The relocation of Route 3 Technical Supplement contains figures showing noise contours along each alternative alignment. It must be stressed that all the alignments parallel Q corridor, a major and unregulated noise source. The noise impacts of Route 3 are insignificant when viewed in the context of noise emissions expected from Q corridor.

- Grade Separations - The specific impacts of each grade separation location will be analyzed as part of the detailed examination of each prior to proceeding to implementation. The overall effects would be minimal, at any rate.

- Construction Noise - Any residence adjacent to an expanded yard, corridor, interlocking, or the Route 3 relocation, would be exposed to short-term noise impacts from trucks and machinery used during the construction of the project. Noise levels in the range of 70 to 95 dBA would be typical at 100 feet. To minimize or eliminate the noise impacts of construction at the residential areas, all equipment used for construction should be equipped with adequate mufflers. All construction within 1,000 feet of a receptor should be confined to the hours between 7:00 a.m. and 10:00 p.m. In addition, any proposed noise barriers should be built prior to the beginning of construction of the yards in order to mitigate construction noise.

- Vibration Impacts - Analytical means of predicting vibration do not exist. However, several general statements regarding the project's effect on vibration levels in the area can be made: the planned use of continuously-welded rail on all new track will greatly reduce current vibration levels, even though higher train speeds on corridors would act to increase vibration after improvement; the implementation of noise barriers will also act to mitigate against adverse vibration impacts (both airborne and ground-transmitted); and overall, the project's effect will be minimal to beneficial, when compared to the No-Build conditions.

HUMAN ENVIRONMENT

A series of studies was conducted to determine what effects each of the alternatives would have on various aspects of the human environment of the area. Subjects examined include social and economic factors, potential impacts on energy consumption and transportation, land use, and cultural resources. Each discussion is structured according to the differences exhibited among the alternatives.

Transportation:

Two types of transportation impacts are expected: improved transit through the Gateway, and improved traffic patterns and access to local areas. To estimate the first, a rail traffic simulation study was conducted. That study indicated that the restructuring project would

reduce the average rail car transit time. This improvement would produce savings resulting from more efficient utilization of rail cars and would reduce shippers' inventory carrying costs. Total savings estimated for the Year 2000, for example, range from $40 million with the Two-Yard Directional Plan, to $67 million if the Three-Yard Bidirectional Plan is implemented (see Table 10).

The second impact would result from the construction of rail/highway grade separation structures and relocating Route 3, thus improving the flow of traffic in the study area. Time saved by motorists currently stopping and slowing at these crossings was estimated using the guidelines described in the US DOT's Procedure for Estimating Highway User Costs, Fuel Consumption and Air Pollution.

In the Year 2000, time savings of 2,367 vehicle-days will be realized at separation structures to be built over new or expanded yards. The rail corridor separations warranted under each plan would further save motorists some 9,000 vehicle-days over the no-build situation. Table 11 shows the estimated savings. The total 11,506 to 12,803 vehicle-days saved translate into $1.5 to $1.7 million in user savings at 1.4 persons per vehicle and a modest value-of-time of $4 per hour. The impacts would be primarily felt in the following communities:

- Brooklyn

  Rerouting Bend Road around Brooklyn will help reduce the amount of traffic which presently goes through the City. Also, relocated Bend Road would provide easy access to the east side of the Madison Yard since a grade separation is included in the plan. The low level of traffic (300 vehicles per day) on Bend Road suggests that this structure may not be worth the $5.5 million cost, however, this would be evaluated further in the detailed design of the expansion of Madison Yard. Improved movement of traffic on Route 3 past Brooklyn would result from the relocation of that highway. Further, traffic past the high school located on 4th Street at Route 3 would be reduced appreciably.

- Centreville

  The addition of three proposed grade separations would improve access for Centreville. With the project, some school bus and public bus schedules and routes will need to be adjusted, but the proposed project will not cause any disruption in wheel-chair lift equipped bus service.

- National City

  Construction of the new Route 3 will improve access to the McKinley Bridge and the northern industrialized areas of the St. Louis metropolitan area and probably decrease traffic volumes through National City.

TABLE 10

ESTIMATED SAVINGS DUE TO IMPROVED RAIL PERFORMANCE

	TWO-YARD DIRECTIONAL ALTERNATIVE	THREE-YARD DIRECTIONAL ALTERNATIVE	THREE-YARD BIDIRECTIONAL ALTERNATIVE
Time			
Reduction in Average Time in the Gateway[1] (hours)	10	13	17
Savings			
Annual Savings on Car Hire Expenditures at Year 2000 Projected Traffic Levels[2] (millions of 1980 dollars)	$20	$25	$34
Annual Savings on Inventory Carrying Costs at Year 2000 Projected Traffic Levels and an Interest Rate of 12 Percent[3] (millions of 1980 dollars)	$20	$25	$33
Total Annual Savings at Year 2000 Projected Traffic Levels (millions of 1980 dollars)	$40	$50	$67

Notes:
1. Supplied by CONSAD. See Technical Supplement Rail Operations Analysis, Volumes I and II.
2. 1980 Car Hire rate is $16.25 per day.
3. 1980 Inventory Carrying Cost for a loaded car is estimated to be $25 per day, from (1) R. D. Samuelson and P. O. Roberts, A Commodity Attribute Data File For Use in Freight Transportation Studies, MIT Center for Transportation Studies, Report CTS 75-20, Nov. 1975; (2) rail equipment specifications; and (3) Yearbook of Railroad Facts, Association of Americal Railroads, 1980. The estimate that 64 percent of all cars are loaded was supplied by CONSAD.

Source: SEK, 1980.

TABLE 11

DAYS SAVED AT GRADE CROSSINGS[1]

(Year 2000)

	TWO-YARD DIRECTIONAL ALTERNATIVE	THREE-YARD DIRECTIONAL ALTERNATIVE	THREE-YARD BIDIRECTIONAL ALTERNATIVE
Days saved at crossings[2] over rail yards	2,367	2,367	2,367
Days saved at optional rail corridor crossings	9,139	9,139	9,380
Total days saved	11,506	11,506	12,803

Note:

1. Data supplied by Illinois DOT, procedure derived from US DOT's Procedure for Estimating Highway User Costs, Fuel Consumption and Air Pollution, Revised May 1980.

2. Data for grade crossing #53 was not available.

Source: SEK, 1980.

- Venice

  The Route 3 relocation will create a complete bypass of the City which will result in less traffic through the center of Venice. Reduced noise, dust, traffic congestion, and vehicular pollution will result. At the same time, access to Venice, as a whole, will be improved. A small reduction in truck traffic will probably occur in (and through) the Venice area as a result of consolidating TOFC activities in the new TOFC facility.

  Construction impacts on transportation are expected to be slight. Most of the project consists of expanding current rail areas and most equipment and supplies would be rail-mounted. An increase in truck traffic on Route 203 north of I-55/70 to supply fill for the Common TOFC Yard would occur, but Route 203 can easily handle the additional traffic.

Land Use:

The differential land use impacts of the three alternatives are summarized in Table 12. The table gives the number of acres in each land use category to be devoted to rail yard use, including present rail acreages. Since land use categories do not correspond with ecological definitions, these numbers will not match habitat acreages in construction areas (as shown on Table 9). The land use impacts are expected to be minimal. Most of the affected acreage already contains rail yards and lines (over 50% for all plans). Agricultural and vacant land also account for a major portion of the total (over 30%). Of the industrial acreage (less than 4%) affected, over half contains vacant structures only. Exhibit H (Land Use) shows the existing land use in the project area.

In addition to the impacts detailed in Table 12, the project will affect land use along the Mississippi River. Approximately 1,500 acres presently containing underutilized rail yards will be cleared by the MARGE project. Clearing this large area creates the potential for redevelopment of the area.

Solid Waste Disposal:

- No-Build - The selection of this alternative would result in no impact on the solid waste disposal system in the Metro-East area.

- Build Alternatives - If any of the build alternatives is selected, extensive removal of existing railroad operating facilities, as well as displaced non-railroad structures, would be required. The major types of materials to be disposed of would include building materials (brick, concrete block, concrete, etc.), steel (rails and structural shapes), and ties and other wood products. Since a major portion of the waste materials would come from the riverfront area which is to be cleared as a part of all of the build alternatives, there would not be any substantial difference in the volume or composition of the waste materials among any of those alternatives.

TABLE 12

LAND USE [1]
(acres)

LAND USE CATEGORY	TWO-YARD DIRECTIONAL ALTERNATIVE	THREE-YARD DIRECTIONAL ALTERNATIVE	THREE-YARD BIDIRECTIONAL ALTERNATIVE	ADMUSTMENTS FOR ROUTE 3 ALTERNATIVES
Residential	49	55	40	(0) [0]
Commercial	29	41	40	(0) [0]
Industrial	7	28 [2]	28 [2]	(-4) [0]
Public	0	2	2	(+1) [0]
Agricultural	186	242	244	(-10) [-7]
Existing Rail Facilities	868	920	905	(+14) [+68]
Vacant	302	389	353	(-3) [0]
TOTAL	1,439 [3]	1,677 [3]	1,612 [3]	(-2) [+61]

1 These figures are based on 175 ft. right-of-way for both the four-lane and two-lane designs.

2 Vacant meat processing facilities cover 12 of these acres.

3 These numbers will not match the totals shown on Table 8, since land use categories do not match habitat categories, and since this table includes items other than the habitat areas included in Table 8.

Note: Acreages based on eastern alignment of Route 3. For western alignment, add the number in parentheses to the preceding number. For the central alignment add the number in brackets to the base number.

Methods of disposal would vary with the type of material and would include the following:

- Where the quantity and condition of the material would justify and permit, an effort will be made to recycle the rails and structural steel members. Other non-ferrous metals such as copper and aluminum may also be found in significant quantities as some of the buildings are razed. These materials will also be salvaged and recycled.

- Good used bricks and stone are generally in high demand as building materials. An effort will be made to make these materials available to interested parties where the salvaging and cleaning operations are compatible with the demolition and clearance schedule.

- A high percentage of the railroad ties and a smaller portion of the other wood products including various beams and trim shapes are expected to be salvaged and sold for re-use.

- Combustible materials will be burned using forced air combustion techniques at those locations where a burning permit can be obtained and the quantity of material justifies the establishment of a combustion pit.

Since virtually all of the waste materials would be free of toxic substances and debris which would support bacterial growth, the problems commonly faced in finding a suitable sanitary landfill should not be encountered. If space is not available in existing landfills in the immediate vicinity, a new disposal site will be developed as part of the project, or a local organization currently involved in landfill operations will be engaged to develop and make available appropriate disposal facilities.

Production and Consumption of Energy

The project requires an initial input of energy for construction and then generates four types of annual energy savings. Energy is also required for track maintenance as rails, ties, and ballast are replaced routinely. The overall impact on energy is calculated for a 58-year period (eight years of construction plus 50 years of use for the rail construction and 30 years of use for road construction); Table 13 summarizes both the energy input and the resulting savings for each plan compared to the No-Build. Savings range from 52 million barrels of oil with the Three-Yard Bidirectional Plan to 43 million barrels with the Two-Yard Directional Plan. The sources of energy savings are described below:

- More efficient yards would require fewer engines to handle the traffic

- A common TOFC yard would eliminate truck interchanges between participating railroads' yards

- Grade separation structures would reduce vehicle slowing, stopping, and idling at crossings

- Improved rail service is expected to attract some current truck users to the rails. Conventional wisdom indicates that truck transportation is four times as energy intensive as rail transportation and twice as intensive as TOFC movements. This impact is not quantified in the table since a thorough analysis of intermodal shifts must begin with detailed models of individual shipper's behavior. This requires costly data processing and is beyond the scope of an EIS. An order-of-magnitude estimate of the intermodal shift can be obtained from published reports, however.

TABLE 13

PROJECT LIFE ENERGY ANALYSIS

(thousands of barrels of oil over 58* years)

	TWO-YARD DIRECTIONAL ALTERNATIVE	THREE-YARD DIRECTIONAL ALTERNATIVE	THREE-YARD BIDIRECTIONAL ALTERNATIVE
Initial Energy Input			
Construction[a]	-3,180	-3,510	-3,390
Maintenance[a]	-787	-1,020	-969
Energy Savings Over the No-Build Case (1990-2040)			
More efficient yards[b]	46,407	50,228	56,118
Common TOFC yard[b]	135	135	135
Grade separation[c] structures over rail lines and yards	507	507	534
Intermodal shifts	d	d	d
Net Energy Savings Over the No-Build Case (1990-2040)	43,082	46,340	52,428
Net Energy Savings Per Year[e]	932	1,004	1,123
Recapture Period (years)[f]	3.4	3.5	3.0

Notes:

* Eight years of construction, 50 year rail project life, 30 year grade separation life

a. Estimated by SEK

b. Engine data supplied by CONSAD, energy use data from U.S. DOT's Energy Requirements for Transportation Systems, June 1980.

c. Data supplied by Illinois DOT, procedure derived from U.S. DOT's Procedure for Estimating Highway User Costs, Fuel Consumption and Air Pollution, Revised May 1980. Data for crossing #53 is not available.

d. Savings not quantified.

e. This calculation pertains to the years after construction is complete.

f. Based on average annual net savings. For rail related items these are calculated by dividing net savings by 50. For the grade separation structures, net savings are divided by 30. Annual net rail savings and annual road savings are then summed. The energy required to construct the project is divided by annual net savings.

Source: SEK, 1980.

A recent study by Roberts[1] analyzed traffic movements between Philadelphia and Cleveland. Roberts assumed that modernization of the intervening Pittsburg yard would reduce mean time in the yard by 2.25 days and reduce the maximum time between cities from 11 to 8 days. The percentage of trains processed in two days would increase from 67 to 83. Simulation results indicated these changes would increase rail traffic by 1.3 percent and decreased fuel use by 1.0 percent. While Roberts' estimates apply specifically to conditions and traffic on the Philadelphia-Cleveland route, his results are probably indicative of the scope of this impact to be expected in St. Louis.

Use of Natural Resources Other Than Energy:

The project will require commitments of some natural resources. The total construction cost of \$600-\$700 million provides an indication of the magnitude of this impact. Quantities of the primary construction materials required for the construction of each alternative are listed in Table 14. No difficulties are anticipated in obtaining these materials, with much obtainable locally.

A substantial amount of fill material will be required for this project. Although the source of fill material is not finalized until actual construction, special provisions for the rehabilitation of all such borrow sites, insuring their aesthetic and ecological acceptability as well as safety, would be written into all construction contracts.

The most likely sources of fill material are borrow pits constructed in the surrounding upland area beyond the bluff line. Careful archaeological surveys of potential borrow pits in the project area will be required and appropriate measures will be used to minimize erosion and other adverse effects. The bluffs adjacent to the proposed project could provide a ready source of fill material. Use of the bluffs for this purpose would, however, further scar them resulting in increased erosion, loss of wildlife habitat, and degraded aesthetic quality of a dominant feature in the area landscape. Although the bluffs are no longer in a completely natural state, concern for their conservation is legitimate and is to be considered when a decision on the sources of fill material is made.

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1 Paul O. Roberts, et al, "Analysis of the Incremental Cost and Trade-Offs Between Energy Efficiency and Physical Distribution Effectiveness in Inter-city Freight Markets," prepared by the Center for Transportation studies at MIT for the Federal Energy Administration, Nov. 1976.

TABLE 14

PRIMARY CONSTRUCTION MATERIALS

	TWO-YARD DIRECTIONAL ALTERNATIVE	THREE-YARD DIRECTIONAL ALTERNATIVE	THREE-YARD BIDIRECTIONAL ALTERNATIVE
Steel Rail (tons)	50,082	66,723	63,280
Wood Ties (tons)	61,266	81,764	77,555
Limestone Ballast (tons)	145,972	195,343	185,324
Concrete (cubic yards)	55,000	55,000	55,000
Asphalt (cubic yards)	8,240,000	8,240,000	8,240,000
Fencing (lineal feet)	131,500	131,500	131,000
Pipe (lineal feet)	268,000	308,000	308,000

Source: SEK, 1980.

Socioeconomic Impacts:

The category of Socioeconomic Environment encompasses several sub-topics. The first four relate closely to the relocation required by the project; Residential Displacements, Replacement Housing, Business Relocations, and Community Values. Next the impacts on local government operations, tax revenues and public services will be discussed; and finally, a section on employment impacts describes the ways in which the project may affect local job opportunities. The possibility for mitigating some of these impacts is also discussed under Socioeconomic Impacts. Detailed discussions of all of these categories are contained in the Socioeconomic Impact Analysis Technical Supplement to the EIS.

Residential Displacements - Residential displacements from any aspect of the build alternatives would occur in only six communities and one unincorporated area of Metro East. In three of the affected areas - Centreville, National City and the Stites/Canteen Township site - displacements would be caused by yard construction. The Two-Yard and Three-Yard Directional Plans would displace 102 households and 369 people in Centreville, while only 73 households and 264 people would be affected by the Three-Yard Bidirectional Plan. In National City either Three-Yard Plan would displace 69 people in 25 houses. Both Three-Yard Plans would also affect 3 households in unincorporated areas adjacent to National City. In summary, then, the Three-Yard Directional Plan would cause the most displacements and the Three-Yard Bidirectional Plan the least. Table 15 summarizes the displacement data by alternative.

TABLE 15

MAXIMUM ESTIMATED HOUSEHOLD DISPLACEMENTS

	TWO-YARD DIRECTIONAL ALTERNATIVE	THREE-YARD DIRECTIONAL ALTERNATIVE	THREE-YARD BIDIRECTIONAL ALTERNATIVE
Alorton	7 (a)	7 (a)	7 (a)
Brooklyn	1 (b)	1 (b)	1 (b)
Cahokia	61 (c)	61 (c)	61 (c)
Canteen and Stites Twps, Uninc.	2 (b)	5 (b,d)	5 (b,d)
Centreville	102 (e)	102 (e)	73 (e)
Collinsville Twp	0	0	0
Dupo	12 (c)	12 (c)	12 (c)
East St. Louis	0	0	0
Granite City	16 (c)	16 (c)	16 (c)
National City	0	25 (d)	25 (d)
St. Louis, Missouri	0	0	0
Sauget	0 (c)	0 (c)	0 (c)
Venice	22 (a,b)	22 (a,b)	22 (a,b)
Washington Park	0	0	0
TOTAL	223	251	222

a Displaced by construction of corridor improvements and rail interlockings.
b Displaced by relocation of Route 3. Note: The three proposed alignments cause identical impacts in all towns except Brooklyn, where the eastern and central alignments displaces one household and the western alignment has no impact.
c Displaced by construction of grade separation structures, which are optional.
d Displaced by construction of New Yard.
e Displaced by expansion of Gateway Yard.
f Displaced by construction of TOFC Yard.

Source: SEK, 1980.

Three communities, East St. Louis, Brooklyn and Venice, would be affected by the relocation of Route 3, displacing 7 structures or 17 people. Alorton would be impacted only by a rail connection, or interlocking, which would affect 5 houses and 2 mobile homes. The project would not affect any homes in St. Louis.

Since the project also includes the construction of grade separations to eliminate auto/rail conflicts, a number of locations were analyzed with respect to amount of train and auto traffic. Delay and safety factors were also considered in the "warranting" process. Of the 17-18 locations which were warranted, seven would be required for streets affected by yard expansions. The remainder are located at conflict points along the rail corridors and their construction would be optional.

Displacements which could result from constructing the optional grade separation structures are included in Table 15. Locations of these crossings are shown in Exhibits C and D. The numbers represent maximum estimates; final design work is expected to reduce the actual number of required displacements. If all optional structures were constructed, 85 residential structures would be displaced, most of which are single-family dwellings. These displacements would occur in Cahokia, Dupo, and Granite City.

Replacement Housing - Checking with local real estate firms, brokers, and in newspaper listings for properties within three miles of the relocation area revealed only 12 residences in Centreville and 46 within three miles which are decent, safe, and sanitary and available for sale.

Further, introducing new track into a residential neighborhood may lower the property value of lots adjacent to the new railroad. Approximately 15 houses that are currently located away from railroad tracks would be adjacent to the rail yard in Centreville under the two directional plans. Track would be introduced next to 13 houses with the Three Yard Bidirectional plan. Conversations with two realtors suggest that the maximum impact on the value of a $10,000 - $15,000 house would be approximately $700.

Rents paid for the existing housing in National City average less than $50 per month. Leases are renewed monthly. No value has been placed on the National City properties since there are no comparable structures in the area and they have never been on the market. It has been suggested, however, that the properties are substandard in their present condition and could not be physically moved to another location. No replacement housing exists in National City and no rental units are available. Suitable and sufficient land is available for the construction of new housing within the incorporated city limits.

The value of the housing to be displaced by the Route 3 relocation in Brooklyn and Venice is estimated to be less than $15,000 per unit and rents average less than $110 per month. A survey of realtors and newspaper ads in Venice and a field inspection of Brooklyn revealed that suitable and sufficient numbers of replacement housing units are presently available. Average market values of displaced structures in Alorton was estimated at $13,000 and, again, research found adequate replacement units in the immediate vicinity.

A detailed relocation plan will be prepared at the time displacements are anticipated. That plan will reflect the Federal Railroad Administration's policy that no residential occupant will be required to vacate a dwelling until adequate replacement housing is made available. To implement this policy, the following three points will be adhered to:

- Before acquisition is undertaken, a comprehensive relocation plan will be prepared and approved, setting out the availability of replacement housing and identifying possible problems and their solutions.

- No project construction will be authorized to proceed until adequate replacement housing is in place (constructed, if necessary).

- The replacement housing, as discussed above, will be fair housing that is available to everyone, regardless of race, color, creed, or national origin. All replacement housing will be "decent, safe, and sanitary."

Cost of Replacement Housing - It is assumed that not all of the residents of the impact area will relocate in the community of origin. Past experience has shown that approximately 40 percent of impacted households will elect to relocate outside the local area or they will find suitable housing themselves within the local area. Another 40 percent of the potential relocatees are expected to be provided with replacement housing in the local area. The remaining 20 percent will opt to have their structures moved and rehabilitated (or to move into another structure which has been rehabilitated). Under these assumptions, it is expected that for the Two-Yard, Three-Yard Directional and Three-Yard Bidirectional Plans, 32, 32, and 22 housing structures, respectively, will need to be built in Centreville. Assuming that the structures average 1,000 square feet per unit, that construction costs for the area are $45 per square foot and that lots cost $2,000 each, constructing replacement houses under each alternative would total approximately $1.5 million, $1.5 million and $1.0 million (1980 dollars), respectively.

Since residents of National City are not property owners but renters, a household rent subsidy would be expected for each renting family. Assuming that the subsidy will be approximately $4,000 per household, a total payment of $ 0, $100,000 and $100,000 under the Two-Yard, the Three-Yard Directional and the Three-Yard Bidirectional Plans, respectively, would be expected.

Business Relocations -In addition to the residential displacements described above, the project will affect a number of businesses throughout the project area.

Only two communities, Centreville and National City, would experience business dislocations resulting from yard construction, but East St. Louis and unincorporated areas in Stites and Canteen Townships would also see impacts on several home-based businesses, a tavern and three small-scale hog farms. Four types of businesses would be displaced by

the Two-Yard and Three-Yard Directional plans in Centreville: three small retail operations, four home-based service businesses, a warehouse, and two small agricultural operations. Each business employs fewer than five people. Since the Three-Yard Bidirectional Alternative requires less land for Gateway Yard improvements than the others, fewer businesses would be affected only two home-based businesses, some farm land and a hog operation would be displaced.

The unincorporated townships would also be affected by construction of the common TOFC yard. The remainder of the displacements would occur in Venice and Brooklyn, associated with the relocation of Illinois Route 3. Rail connections or interlockings would also cause displacements in Venice - the McKinley Bridge office, a small junk yard, some park land (see Recreation) and a portion of the Granite City Army Engineers Depot. Two St. Louis businesses would be affected by the construction of a rail connection to McKinley Bridge.

Along with the residential displacements resulting from the construction of grade separations discussed above, there would be business displacements. If all were built, 17 businesses would have to relocate. The affected communities are: Cahokia, Collinsville Township, Dupo, Granite City, Sauget and Washington Park. Unimproved land in Canteen Township would also be affected by grade separation construction. Here again, these estimates are based on preliminary design plans; refinements may reduce these impacts. Table 16 summarizes the information gathered on businesses which would be expected to relocate if the project were constructed, including businesses affected by the grade separations.

Table 17 distributes the residential and business displacements noted above across the elements of the restructuring alternatives. Further, detail is included in the Socioeconomic Impact Analysis Technical Supplemental.

Community Values - The Community Involvement Program (CIP) of the MARGE project was established to identify and address issues which were of concern to the residents and elected officials of all the communities affected by the project. In addition to the railroad committees created to assure continuing involvement by the rail industry, the MARGE project organized three committees to obtain public input - the Public Agency Steering Committee (PASC), the Public Agency Technical Advisory Committee (PTAC), and the Citizens Advisory Committee (CAC). This last served as a vehicle for assessing community values within the affected muncipalities. A more detailed description of the CIP may be found in Appendix A of the Socioeconomic Impact Analysis Technical Supplement.

Community cohesion (neighborhood stability), safety of rail operations, and availability of jobs were the most important concerns expressed by the residents of the project impact area. Past experiences with relocation (from railroad and highway projects) have made citizens wary of additional rail-caused displacements. Residents have also voiced concern over the possibility of being dispersed to areas outside of their own communities as a result of rail restructuring. Project personnel are aware of this citizen concern and steps will be taken to maintain community cohesion, wherever possible.

TABLE 16

ESTIMATED BUSINESS DISPLACEMENTS*

	TWO-YARD DIRECTIONAL ALTERNATIVE	THREE-YARD DIRECTIONAL ALTERNATIVE	THREE-YARD BIDIRECTIONAL ALTERNATIVE
Alorton	0	0	0
Brooklyn	1 (b)	1 (b)	1 (b)
Cahokia	5 (c)	5 (c)	5 (c)
Canteen and Stites Twps, Uninc.	3 (b,d,f)	4 (b,d,f)	4 (b,d,f)
Centreville**	6 (e)	6 (e)	3 (e)
Collinsville Twp	0	0	2 (c)
Dupo	1 (c)	1 (c)	1 (c)
East St. Louis	2 (b)	2 (b)	2 (b)
Granite City	6 (c)	6 (c)	6 (c)
National City	0	2 (d)	2 (d)
St. Louis, Missouri	2 (a)	2 (a)	2 (a)
Sauget	1 (c)	1 (c)	1 (c)
Venice	3 (a,b)	3 (a,b)	3 (a,b)
Washington Park	2 (c)	2 (c)	2 (c)
TOTAL	32	35	34

a Displaced by construction of corridor improvements and rail interlockings.
b Displaced by relocation of Route 3. Note: The three proposed alignments cause identical impacts in all towns except Brooklyn, where the eastern and central alignments displace one business and the western alignment has no impact.
c Displaced by construction of grade separation structures, which are optional.
d Displaced by construction of New Yard.
e Displaced by expansion of Gateway Yard.
f Displaced by construction of the TOFC yard.

* Partial takings are included along with displacements.
** Four additional businesses are operated from residences; each has an estimated employment of 1-5. They will be displaced by the directional alternatives.

Source: SEK, 1980.

TABLE 17

PERCENTAGE OF RESIDENTIAL DISPLACEMENTS
ATTRIBUTED TO INDIVIDUAL PROJECT FEATURES

	TWO-YARD DIRECTIONAL ALTERNATIVE	THREE-YARD DIRECTIONAL ALTERNATIVE	THREE-YARD BIDIRECTIONAL ALTERNATIVE
Rail Yard	46%	52%	46%
Rail Corridors and Interlockings	4%	4%	4%
TOFC	0%	0%	0%
Route 3	10%	9%	10%
Grade Crossings	40%	35%	40%
TOTAL	100%	100%	100%

Source: SEK, 1980.

PERCENTAGE OF ESTIMATED BUSINESS DISPLACEMENTS*
ATTRIBUTED TO INDIVIDUAL PROJECT FEATURES

	TWO-YARD DIRECTIONAL ALTERNATIVE	THREE-YARD DIRECTIONAL ALTERNATIVE	THREE-YARD BIDIRECTIONAL ALTERNATIVE
Rail Yard	21%	25%	17%
Rail Corridors and Interlockings	9%	9%	9%
TOFC	9%	9%	9%
Route 3	15%	14%	15%
Grade Crossings	46%	43%	50%
TOTAL	100%	100%	100%

* Partial takings are included along with displacements.

Source: SEK, 1980.

Safety has been identified as a local concern since an unsafe place (through experience or perception) will not attract growth in population or industry. The possibility of accidents in rail yards and along corridors is a source worry for affected communities. Safeguards are included in the rail restructuring plan (see public safety section) to help mitigate this concern.

Residents of the project area are also interested in potential employment resulting from rail restructuring. Restructuring is planned to improve transportation within and through the St. Louis gateway, which should make the area more attractive to new industries and result in increased employment. Additionally, the project will create temporary jobs in the construction sector.

Local Government Concerns - Local governments receive revenue from diverse sources; the proposed project would affect four of these. Constructing the new facilities would change (generally increase) the property taxes collected from railroads. Tax revenues on displaced real estate would be lost, although if property owners relocate within the same community they would continue to contribute this tax income. Resumption of train traffic on the McKinley Bridge would increase the tolls collected by the City of Venice. Finally, cities receiving intergovernmental transfers based on population may be affected by relocation. Exhibit B depicts the locations of the relevant minor civil divisions.

The following types of districts collect property taxes: county, township, road and bridge, city, school, college, health, hospital, sanitary, fire, and park. The total impact for St. Clair County is two or three percent of current property tax revenue. The total impact on Madison County taxing districts would be less than one percent of current property tax revenue.

While no particular district is expected to experience a significant (five percent or greater) drop in revenue, several districts are projected to receive substantial increases with the Three-Yard Plans. Property tax revenues collected by Brooklyn, Stites Township, School District 188, and the Stites Township Park District may increase by more than 50 percent with the Three-Yard Directional Plan. Under the Three-Yard Bidirectional Plan, revenues would increase by at least 50 percent in Brooklyn and National City as well as Stites Township, School District 188, and the Stites Township Park District. Tables 18 and 19 summarizes the percentage changes in property tax revenues for St. Clair and Madison Counties, respectively.

According to a contract between the City of Venice and the Illinois Terminal Railroad, the City receives fixed annual payments from the Illinois Terminal Railroad for the first 200,000 rails cars per year that cross the McKinley Bridge, and $1 for each additional car. (The fixed annual payment is $250,000 until 1988 and $25,000 from 1988 until 2008.)

TABLE 18

CHANGE IN PROPERTY TAX REVENUE AS PERCENT OF TOTAL
IN ST. CLAIR COUNTY TAXING DISTRICTS

	TWO-YARD DIRECTIONAL ALTERNATIVE	THREE-YARD DIRECTIONAL ALTERNATIVE	THREE-YARD BIDIRECTIONAL ALTERNATIVE
COUNTY GENERAL	a%	1%	1%
COUNTY OTHER	a	a	1
TOWNSHIP			
Stites	15	54	56
Canteen	a	-2	a
East St. Louis	5	2	a
Centreville	6	6	6
Sugar Loaf	a	a	a
ROAD AND BRIDGE			
Canteen	a	a	a
Centreville	6	6	6
Sugar Loaf	a	a	a
CITY			
Village of Sauget	a	a	a
Village of Brooklyn	35	65	68
Village of National City	8	45	54
City of East St. Louis	a	2	2
City of Centreville	42	42	36
Village of Alorton	a	a	a
Village of Cahokia	-1	-1	-1
Village of Washington Park	a	a	0
Village of Dupo	-1	1-	-1
SCHOOL DISTRICT			
Unit 189	4	6	3
Unit 188	43	142	146
Unit 187	8	8	8
Unit 10	a	a	a
Unit 196	a	a	a
COLLEGE DISTRICT			
#522	a	a	a

TABLE 18 (continued)

CHANGE IN PROPERTY TAX REVENUE AS PERCENT OF TOTAL IN ST. CLAIR COUNTY TAXING DISTRICTS

	TWO-YARD DIRECTIONAL ALTERNATIVE	THREE-YARD DIRECTIONAL ALTERNATIVE	THREE-YARD BIDIRECTIONAL ALTERNATIVE
HEALTH DISTRICT			
Eastside[b]	4%	6%	6%
HOSPITAL DISTRICT			
Centreville	7	7	7
SANITARY DISTRICT			
Metro East[b]	4	7	6
FIRE DISTRICT			
Cahokia	a	a	a
Village of Brooklyn	a	a	a
Camp Jackson	48	48	41
Church Road	6	6	7
State Park	a	a	-1
Dupo	-1	-1	-1
PARK DISTRICTS			
City of East St. Louis	a	a	1
Stites	13	60	62

Notes: "a" denotes a change of less than one percent.
"b" denotes districts that overlap with Madison County. Revenue changes in both counties are reported on the St. Clair County tables.

Source: SEK, 1980.

TABLE 19

CHANGE IN PROPERTY TAX REVENUE AS PERCENT OF TOTAL IN MADISON COUNTY TAXING DISTRICTS

	TWO-YARD DIRECTIONAL ALTERNATIVE	THREE-YARD DIRECTIONAL ALTERNATIVE	THREE-YARD BIDIRECTIONAL ALTERNATIVE
COUNTY	a%	a%	a%
TOWNSHIP			
Venice	-1	-1	-1
Granite City	a	a	a
Collinsville	NA	a	-1
ROAD AND BRIDGE			
Venice	-3	-3	-3
Collinsville	NA	a	a
CITY			
Venice Corp.	-2	-2	-2
Madison Corp.	a	a	a
Granite City Corp.	a	-2	-2
SCHOOL DISTRICT			
#3	-4	-4	-4
#9	a	a	a
#12	a	a	a
PARK DISTRICT			
Venice	-4	-4	-4
Granite City Park	a	a	a

Note: "a" means a change of less than one percent.

Source: SEK, 1980.

At present, the bridge carries no rail traffic. Daily rail traffic expected if McKinley Bridge were rehabilitated, which is an options under the project (see the Bridge Options discussion in the Appendix), and consequent annual revenue projections, are listed below:

		Number of Rail Cars/Day	Variable Revenue/Year*
1979	No Build	0	0
2000	No Build	0	0
2000	2 Yard Directional	2,254	$408,580
2000	3 Yard Directional	1,571	$224,170
2000	3 Yard Bidirectional	2,505	$476,350

* Revenue is calculated by 1) multiplying the number of rail cars per day by 270 working days per year; 2) subtracting 200,000 rail cars per year and 3) multiplying by $1 per car.

Source: SEK, 1980.

The project's impact on McKinley bridge truck traffic will be minimal. Approximately 16 trucks involved in TOFC work that used the McKinley Bridge daily in 1979 are expected to begin using the Poplar Street Bridge once the Common TOFC Yard were constructed. The Year 2000 estimate of this diversion is 33 trucks per day. At a maximum toll of $0.90, the Year 2000 loss of truck toll revenues would be $8,019.

Most cities receive some intergovernmental transfers based on population. The impact of the project on this type of revenue cannot be calculated precisely since sources of such funds are numerous and change over time. An estimate of the order-of-magnitude of this impact is calculated for Centreville, however, where the largest residential dislocation is expected to occur. Centreville receives intergovernmental transfers of $90 per resident in categories in which some or all funds are disbursed on a per capita basis. At this rate, the City's revenues would decline by $24,000 (two percent of total revenue) if all residents displaced by the bidirectional alternative moved out of Centreville. Revenues would decline by $33,000 (three percent of total 1979 revenues) if everyone displaced by either of the directional plans relocated outside the City. This outcome is considered unlikely. Further, the impact of a population reduction on City costs is not known.

Public Services - Public services are affected in two ways: 1) a sewage treatment plant will be relocated, and 2) a reduction in rail/highway conflicts should improve the provision of emergency services.

The New Yard to be constructed under either Three-Yard Plan would displace the Lansdowne Sewage Treatment Plant, which has a design average daily flow of 6.0 mgd. The plant serves Brooklyn, Caseyville, Fairmont City, Madison, National City, Venice, Washington Park, the unicorporated areas of Stites and Canteen townships, and parts of the unincorporated areas in Venice and Nameoki townships. Built in 1964, it is operated by the East Side Levee and Sanitary District and is manned by five operators and a chief.

The plant currently provides only primary treatment; thus, it is not in compliance with the National Pollution Discharge Elimination System permits. Future use of this facility is, therefore, uncertain. Several recent studies have suggested that it be replaced by a new regional plant or converted to a pumping station and treating the Lansdowne area sewage at Granite City (Metcalf and Eddy, 1976). The Granite City plant, provides primary and secondary treatment, in 1976, was expected to have sufficient excess capacity to handle the Lansdowne sewage. This plan has not been implemented.

Constructing grade separation structures is expected to enhance the provision of emergency and other public services throughout the area.

Area Employment Impact - The proposed project is expected to affect area employment in several ways. First as noted in the Construction Impact section, below, 8,500 to 9,500 person-years of labor will be required for construction. Second, the project will improve the efficiency of rail yard operations, thereby reducing railroad labor requirements. The estimated reduction is based, in part, on the estimate of future employment for the no-build case. Railroad employment has been decreasing in recent years, with a loss of some 2,000 railroad worksers in St. Clair County between 1970 and 1976, alone. While some continuing decline is likely, the precise magnitude of this change is unknown. The current level of employment, 4,271, therefore represents a maximum estimate of no-build employment in the year 2000.

Employment levels required in the alternative plans are listed in Table 20. The difference between these numbers and 4,271 represents a maximum estimate of job losses resulting from the project alternatives. The largest loss, 539 railroad jobs, occurs with the Three-Yard Bidirectional plan. Jobs lost in the Two-Yard and Three-Yard Directional cases are 77 and 181, respectively.

The impact of this employment reduction on the existing Gateway community is eliminated during the first six years by labor protective agreements. All workers continue to be paid for this period. During this time, some workers are expected to withdraw from service due to death, retirement, or other reasons. Assuming past attrition rates continue, the Three-Yard Bidirectional plan will produce only 27 surplus employees at the end of the six-year protective period. Even fewer surplus employees result with the Two-Yard and Three-Yard Directional Plans. The Technical Supplement entitled A Study of the Project Effect on Railroad Employment contains detailed specifications on the derivation of these numbers.

Increased efficiency of TOFC yard operations also reduces the need for some non-railroad workers. Approximately 355 such jobs may be eliminated. The impact of this reduction in jobs has been assessed using the St. Louis Input-Output Model constructed by Dr. Floyd Harmsten based on the assumption that each dollar paid to households recirculates briefly in the St. Louis area economy. Each $1 paid in wages generates $1.09 of additional local business, $1.46 of personal income, and $0.07

TABLE 20

ESTIMATED IMPACT ON

YEAR 2000 EMPLOYMENT*

	NO-BUILD ALTERNATIVE	TWO-YARD DIRECTIONAL ALTERNATIVE	THREE-YARD DIRECTIONAL ALTERNATIVE	THREE-YARD BIDIRECTIONAL ALTERNATIVE
Number of jobs (year 2000)	4,271**	4,194	4,090	3,732
Loss in number of railroad jobs from no-build case	-	77	181	539
Surplus employees at end of 6-year protective period	-	5	2	27
Loss in number of TOFC related non-railroad jobs	-	355	355	355
Impacts of job losses on local business (thousands of 1980 dollars)	-	$10,647	$13,210	$22,034
Impacts of job losses on local personal income (thousands of 1980 dollars)	-	$14,261	$17,694	$29,513
Impacts of job losses on local taxes (thousands of 1980 dollars)	-	$ 684	$ 848	$ 1,415

* This table considers only rail jobs and rail-induced jobs. Construction jobs are described in the Construction Impact section. All job-loss figures are maximum (worst-case) estimates.

** This represents a maximum estimate of Year 2000 employment.

Source: SEK, 1980

in local taxes. At average annual earnings of $22,611, the projected job losses could lead to the reductions in business, personal income, and taxes shown in Table 25. Using the same multiplier (3.02) that was developed to calculate the number of induced jobs lost produces an estimate of 1,072. Those reductions are more than made up for by the increases expected due to the impacts of construction, as shown on Table 26 and discussed below.

Despite the loss of rail jobs, increased rail efficiency may have an overall positive impact on local employment. Transportation plays an important role in the local economy both as an industry itself and as part of the infrastructure serving other local industries. Improved transit times produce tangible benefits for rail customers, as described in the transportation section. The project is therefore expected to bolster the area economy by strengthening the local infrastructure. While this effect is not quantified, a healthy local transportation industry may be important in attracting firms to St. Louis. Transportation is a key local advantage, with St. Louis, the hub of the nation's transportation system, offering excellent access to U.S. and regional markets by all modes.

Finally, the project will free currently underutilized riverfront land for possible redevelopment. A preliminary redevelopment study being conducted in conjunction with the MARGE project has suggested some potential land uses for the area which are compatible with various community plans. If such a plan were realized, new jobs could be created. While this proposed project does not guarantee implemention of any plan, it does create the potential for redevelopment and the MARGE staff has pursued opportunities to discuss development options with local community leaders.

Construction Impacts:

Depending on the alternative selected, construction would cost $628-$702 million, as shown in Table 21. Components of this cost estimate are described in Chapter II of the EIS. Approximately eight years would be required for construction, with the largest expenditures occuring in years two through four. Approximately $10.5 million has been budgeted for measures to minimize disruption. Railroad, pedestrian, bicycle, and vehicular traffic will be maintained at all times, with appropriate measures to ensure safety. Interruption of the local street system would be kept to a minimum by appropriate scheduling of project construction, specifically of grade separations and bridges. When temporary closings of local streets are required, these closings will be of a minimum practical duration, and will be coordinated with local officials.

The proposed project would involve the use of fill material (an estimated 5.5 million cubic yards). The impacts involved in obtaining appropriate sources of this material have been considered in a previous section. The disposal of excess and unsuitable materials and debris resulting from construction activities will be done in such a manner that public or private property will not be damaged or endangered, and in accordance

TABLE 21

LOCAL CONSTRUCTION IMPACTS

	TWO-YARD DIRECTIONAL ALTERNATIVE			THREE-YARD DIRECTIONAL ALTERNATIVE			THREE-YARD BIDIRECTIONAL ALTERNATIVE		
	Construction	Design/ Management	Total	Construction	Design/ Management	Total	Construction	Design/ Management	Total
Direct Effects									
a. cost[1] (millions of 1979 dollars)	$ 587	$ 41	$ 628	$ 656	$ 46	$ 702	$ 647	$ 45	$ 692
b. labor expenditures[2] 40% for Construction 100% for Design/Management (millions of 1979 dollars)	$ 235	$ 41	$ 276	$ 262	$ 46	$ 308	$ 259	$ 45	$ 303
c. Person-years[3]	7,932	539	8,471	8,881	605	9,486	8,780	577	9,357
Induced Effects									
a. Person-years of Induced Employment[4]	-	-	25,582	-	-	28,648	-	-	28,258
b. Local Business Generated[5] (millions of 1979 dollars)	-	-	$ 301	-	-	$ 336	-	-	$ 330
c. Local Personal Income Generated[6] (millions of 1979 dollars)	-	-	$ 403	-	-	$ 450	-	-	$ 442
d. Local taxes generated[7] (millions of 1979 dollars)	-	-	$ 19	-	-	$ 22	-	-	$ 21

1 From SEK.

2 Labor costs as percentages of total costs were estimated by SEK for Construction and Design/Management. The 40 percent used for construction was calculated by SEK, taking into account the reduced labor required for railroad construction as compared to the labor intensity of highway construction.

3 Labor expenditures divided by the annual cost per person yields person-years. For construction the annual cost per person equals the average hourly cost of $14.75 (including fringe benefits and contractor profit) multiplied by the standard work-year of 2000 hours. For Design/Management the average hourly cost is $38.

4 Construction employment multiplier is 3.02 (see text).

5 Business multiplier is 1.09 (see text). This number has been applied only to the direct employment, in order to produce a conservative estimate.

6 Personal income multiplier is 1.46 (see text). This number has been applied only to the direct employment, in order to reduce a conservative estimate.

7 Local tax multiplier is .07 (see text). This number has been applied only to the direct employment, in order to reduce a conservative estimate.

with any requirements which may be deemed appropriate in minimizing the potential adverse effects of such disposal. Funding for such solid waste disposal is included in the one and one half to two percent of the total project cost designated for mitigation measures.As required in Section 107.01 of the State of Illinois, Department of Transportation Standard Specifications for Road and Bridge Construction, contractors will at all times observe and comply with all Federal and State laws, local laws, ordinances, and regulations which in any manner affect the conduct of their work.

Construction of the project will require an estimated 8,500-9,500 person-years of labor. The derivation of these figures is detailed in Table 21. Further, Table 22 shows a breakdown of these labor needs by skill type. Most or all of these needs could be filled locally. Two types of costs are considered: construction costs and design/management costs. As shown in the table, labor costs are assumed to constitute 40 percent of the construction cost and 100 percent of the design/management cost. Hourly 1979 labor costs are estimated at $14.75 for construction (Bureau of Labor Statistics and SEK) and $38.00 for design/management (SEK). Both figures include fringe benefits, contractor profit and include salary-related expenses. Each person is assumed to work 2000 hours per year.

TABLE 22
CONSTRUCTION EMPLOYMENT
NEEDS BY SKILL LEVEL
(Person-Years)

	TWO-YARD DIRECTIONAL ALTERNATIVE	THREE-YARD DIRECTIONAL ALTERNATIVE	THREE-YARD BIDIRECTIONAL ALTERNATIVE
Skilled Labor	1,583	1,773	1,758
Semi-skilled	2,383	2,664	2,637
Unskilled	3,966	4,444	4,386
Total	7,932	8,881	8,780

Creation of these jobs will generate additional local business, personal income, and taxes. Estimates of the magnitude of these induced impacts were calculated from information provided in the 1972 St. Louis Input-Output Model.* This model was constructed at the University of Missouri at Columbia. Approximately $300-330 million (1979) dollars of additional local business will be generated by the project. The purchase of some materials locally, as is expected, would increase the impacts shown here. Restated in terms of employment, approximately 25,500 to 28,700 person-years induced employment could result from the project. These figures represent totals for the entire eight-year construction period.

Detailed construction staging (see Table 23) would be necessary to reduce negative construction impacts. For instance, grade separations or street rerouting must be provided at locations where streets and highways would be severed by yard construction, before such construction progresses to the point of traffic disruption. Residential and business relocations must be accomplished prior to impact. In some instances housing of last resort may be required which would require considerable lead time. The construction schedule would provide for a two year period to perform mitigation measures prior to major yard construction.

* An Input-Output Model of the St. Louis Region 1972, St. Louis Regional Commerce and Growth Association

TABLE 23

POTENTIAL PROJECT CONSTRUCTION STAGING*

YEARS/PROJECT ELEMENT	RIVER BRIDGE IMPROVEMENTS	LAND ACQUISITION	YARD IMPROVEMENTS	CORRIDOR IMPROVEMENTS	ROUTE 3 RELOCATION	OTHER: RELOCATION AND MITIGATION GRADE SEPARATION & RIVERFRONT FACILITIES RELOCATION	TOTALS
1**	$12.5	$2.0	$ 35.5		$2.0		$52.0
2	$15.0	$2.4	$27.6		$8.0		$53.0
3	$14.0		$38.0	$6.0	$3.8	$15.0	
4	$20.0		$67.0	$4.0	$3.9	$15.0	
5			$40.0	$34.4	$7.8	$20.0	
6			$44.0	$34.4	$7.9	$20.0	
7			$44.0	$34.4		$17.7	
8			$43.9	$34.6		$17.7	
Totals	$61.5	$4.4	$34.0	$147.7	$33.4	$105.4	$692.5

NOTES:

* For illustrative purposes. Alternative shown is the Three-Yard Bidirectional Plan Since it's costs lie between the other two Build alternatives. Costs shown are full-build including all project sub-elements, and do not reflect the possibility that a value engineering analysis may reduce the overall costs (see Chapter II).

** Earliest year for beginning project would be late 1981.

The Two-Yard Alternative would expand Gateway and Madison Yards. Expansion of Gateway Yard could be accomplished by constructing the classification and departure tracks without interfering with day-to-day yard operations. The addition of this capacity would improve yard operations to the extent that further modifications to be made to the existing yard could be performed with minimal negative impact. The expansion to Madison Yard would involve extending the length of classification tracks and increasing the length and number of receiving and departure tracks. Even with the utmost detailed planning and coordination, interference with yard operations would occur and service would deteriorate. This expansion would be scheduled over a six-year period to minimize these effects.

The Three-Yard Alternative would provide for the expansion of Gateway Yard, the construction of New Yard and modification of Madison Yard to handle local industrial traffic. The expansion of Gateway Yard could be accomplished as outlined in the Two-Yard Alternative with minimal negative impact to yard operations. The New Yard could be constructed with minimal negative impact on rail operations. Following the construction of New Yard, Madison Yard could be modified with no adverse impact on local industrial traffic. The Three-Yard Alternatives could be implemented with much less interference with rail operations and less deterioration of rail service than the Two-Yard Alternative.

Public Health:

Three principal considerations affecting long-term public health will be improved under any of the "build alternatives." These are air quality, the acoustic environment, and accessiblity to health care facilities, fire stations, and other emergency services. All of these are addressed in other sections of this chapter. Increased speed and efficiency of rail operating operations, along with reduced delay for automobiles as a result of the project would improve air quality. Noise emissions would be controlled with mitigation measures, resulting in a decrease in the number of residences exposed to excessive rail noise. Traffic patterns would be improved, reducing rail/vehicular conflicts and improving access for emergency services.

Public Safety:

Safety concerns in the project area are associated with the possibility of accidents during rail yard or corridor operations or the risk of collisions between trains and motor vehicles at rail grade crossings. These concerns would be addressed by the project in a number of ways.

The leading cause of rail corridor accidents is failure of track, roadbed and structures. The potential for such accidents would be greatly reduced in the MARGE project by the installation of a stronger track structure and a more vigorous track maintenance program. Strengthened bridge structures, electronic monitoring equipment and an improved communications system would also enhance safety. These measures would be implemented in all Build Alternatives.

A fire station would be provided at each major yard and manned by personnel trained in the handling of chemical spills and explosions. Currently railyard fires and accidents are handled by local fire protection districts. Extensive coordination between railroad safety personnel and community disaster contingency planning agency representatives would enhance the prevention and mitigation of rail accidents.

Constructing grade separations over new or expanded yards, and constructing optional grade separation structure at warranted rail/ highway crossings would reduce the incidence of train/motor vehicle accidents. Savings in expected accident frequency for each crossing under each alternative were calculated according to federal guidelines. The savings take into account the number of vehicles per day, number of trains per day, type of existing crossing protection, and the crossing's setting (urban or rural). For a detailed analysis of the grade crossing issue see the Grade Separation Analysis Technical Supplement. Constructing all of the proposed structures would prevent an estimated 13 or 14 accidents over a 30-year period, at a cost of $28 to $31 million.

Aesthetic Environment and Scenic Resources:

Much of the area under consideration for proposed construction currently contains old or abandoned rail yards and warehouse or other industrial facilities. Although area aesthetics are constrained somewhat by economic conditions, the potential exists, with the project, to contribute to Metro-East scenic resources. A number of community planning efforts include attempts to beautify the surroundings. The City of East St. Louis is preparing an application for U.S. Park Service funding to construct a riverfront promenade. Activities such as these will be fostered by the MARGE project.

If the No Build alternative is selected, opportunities for changing the aesthetic or scenic qualities of the area would continue to be limited. If any of the build alternatives is selected, however, the opportunity will exist to consolidate the rail operations and clear over 1,500 acres of highly visible riverfront land for redevelopment. Such redevelopment would be of higher aesthetic quality and the opportunities for public access to the river would be enhanced.

Recreation Areas and Opportunities:

Only one direct recreation impact would occur (see Exhibit J) - a rail interconnection would impact Lee Park in Venice, displacing some recreational facilities. The park covers 32 acres and contains ballfields, picnic areas, playground equipment and tennis and basketball courts. The project plans include provisions for functional replacement to mitigate this displacement. A 4(f) discussion is included in this EIS to explain the impact of the project on the park and to describe mitigation measures in more detail.

The freeing of the land on the riverfront creates opportunities to increase recreational facilities for Metro East residents. A number of suggestions have been advanced by local planning agencies and the redevelopment study includes extensive consideration of recreational

resources. The previously mentioned riveredge promenade being proposed by the City of East St. Louis is a positive step in improving the recreational opportunities in the area. Table 24 lists public parks and recreation areas in the study area. There will be small-scale and indirect impacts of the project on various recreation areas. (See Socioeconomic Technical Supplement.)

Cultural Resources:

There are only two sites in the area currently listed on the National Register of Historic Places, - the Cahokia Mounds Site in Collinsville, Illinois, and the Eads Bridge, which spans the Mississippi River (Exhibit K). Consultation with the Office of the State Historic Preservation Officer (SHPO) has been on-going during the project. It has been determined that neither of these sites would be affected by project activities.

Of the eight sites which have been suggested as having potential National Register significance (Exhibit K), only three would actually be affected by any of the restructuring alternatives. Both Three-Yard Alternatives would affect the Terminal Railroad Roundhouse and shops, located in Brooklyn, Illinois, and the National City Houses. The construction of New Yard would displace both of these sites. Since the Two-Yard Plan would only expand Madison Yard, requiring less land, it would not affect these sites.

The third site, the Wabash Roundhouse in Brooklyn, would be affected only by the relocation of Route 3 - the West Plan. The interchange with Bend Road in Brooklyn would isolate the roundhouse in a quadrant of the intersection. It would not be displaced by construction but only suffer restricted access.

The other five sites are located in the riverfront area of East St. Louis. The only project activities which would take place near these sites would be the demolition and clearance of rail facilities from the riverfront. If, however, riverfront development were to occur, the potential for impacting these sites would increase.

After receiving concurrence from the SHPO, detailed analyses of all these sites will be submitted along with a Request for Determination of Eligibility to the National Register. Coordination with the SHPO and the Advisory Council on Historic Preservation will be continued after a Determination of Significance is made. Section 106(f) case studies will be prepared reflecting this coordination and agreement on suitable mitigation measures.

Possible mitigation measures for these sites include complete data recovery through excavation, archival research and oral history. Architectural documentation would be done in accordance with procedures established by the Historic American Engineering Record (HAER) and the Historic American Buildings Survey (HABS). The possible preservation and rehabilitation of some of the sites has been suggested as a possible mitigation measure. Adaptive reuse of some of the buildings located on the riverfront might be included in efforts to redevelop that area.

Resources identified as part of the expanded archaeological reconnaissance will be treated in the same manner as those evaluated during the testing. Based on recommendations received from the SHPO and the project archaeologists, further testing will be undertaken and results submitted for determination of significance, if necessary.

TABLE 24
PUBLIC PARKS AND RECREATION AREAS
IN THE MADISON AND ST. CLAIR COUNTY STUDY AREAS
(1979)

Place/Name	Location	Size (acres)	Playground (acres)	Play Area (acres)	Softball	Baseball	Basketball	Tennis Courts	Fishing	Swimming Pool	Ice Skating Rink	Picnic Shelter	Picnic Tables
Madison County													
Venice:													
Lee Park	Broadway & Klein St.	32.0	yes		2	1	1	3				1	many
Madison:													
City Park	12th & Washington	2.4				2							
City Park	3rd & Washington	2.4				2							
West Madison Recreation Center	7th & Lee	2.4	yes										
Neighborhood Park:													
County Park	111 Pevely Lane	6.0	1.5	4.5							1	6	
Regional:													
Nature Trail (Pontoon Beach to LeClair Station)	Lake Drive	60.0		(Nature Trail)									
Horseshoe Lake S.P.	IL 162, I-70, State 203 and 111	959.6		(Partly Developed)					Yes				
St. Clair County													
Brooklyn:													
Robin Stadium Park	8th & Washington	13.0	yes			1							

TABLE 24 (continued)
PUBLIC PARKS AND RECREATION AREAS
IN THE MADISON AND ST. CLAIR COUNTY STUDY AREAS
(1979)

Place/Name	Location	Size (acres)	Playground (acres)	Play Area (acres)	Softball	Baseball	Basketball	Tennis Courts	Fishing	Swimming Pool	Ice Skating Rink	Picnic Shelter	Picnic Tables
Cahokia:													
Cahokia Park	90 Cahokia Park Drive	6.0	1	54					5 (lake)	1	1	1	10
East St. Louis:													
19 parks		182.5	7.7	9.7	9	13	1	7		2		6	92
Sauget:													
Valley Park	Monsanto & Little Street	36.0		(Undeveloped)									
Regional:													
Cahokia Mounds S.P.	Route 40 & Black Lane	776.4	yes	(Museum and Archaeological sites)									
Frank H. Holten S.P.	Lake Drive IL 157	1,123.0	yes	(Lakes and trails)					Yes				
St. Louis City:													
Jefferson National Expansion Memorial	11 North 4th	91.0		(Visitor Center, Museum, Gateway Arch)									

Source: Recreation Lands and Facilities Inventory Update, East-West Gateway Coordinating Council, July 1979.

Section V

CHAPTER V

LONG AND SHORT TERM IMPACTS

SUMMARY

Short-term Impacts:

The No-Build Alternative has been evaluated and will impart no short-term impacts to the natural environment of the study area. The short-term impacts of all three build alternatives are directly related to the success of the suggested mitigative measures. The short-term impacts of greatest magnitude will be associated with construction and include:

- erosion from wind and water
- noise from construction machinery
- wildlife habitat disturbance by temporary roads and human contact

The severity of short-term impacts for any build alternative can be significantly reduced if mitigative measures are implemented.

The No-Build alternative is expected to have no significant short-term impacts on the human environment except on transportation. Both vehicular traffic delays resulting from at-grade rail traffic conflicts and delays in handling rail cars are expected to worsen in the absence of the project.

The primary short-term difference between the three Build plans will be relocation. The largest number of displacements will occur with the Three-Yard Directional alternative (251 households and 35 businesses). Twelve percent fewer residential displacements will occur with either of the other two plans. One less business will be displaced with the Three-Yard Bidirectional plan and two fewer firms will be impacted by the Two-Yard plan. The remaining significant impacts are common to all three plans. These include:

- An irretrievable use of natural resources such as wood for ties, steel for rails, and earth for fill
- The disruption of traffic flows in the study area during construction
- A loss of park land in Venice, Illinois (which will be replaced)
- The displacement of both residential dwellings and business establishments (nearly 50 percent of the displacements result from constructing grade separations and relocating Route 3, with the balance occurring as a result of yard and corridor expansions)

- Potential temporary delays in emergency public services and

- A significant increase in construction and related employment.

Both energy and other resources will be consumed during the construction period and these cannot be replaced. However, there are project impacts which can be mitigated. While Lee Park in Venice will be adversely impacted by the project, functional replacement of displaced facilities in advance of construction will fully mitigate this project impacts. Residential impacts will be mitigated by developing a housing relocation plan to ensure that each affected household is satisfactorily rehoused.

Long-Term Impacts:

The No-Build Alternative can be assumed to have a negative impact on the natural environment of the project area. Without project implementation there would be a continual degradation of the natural environment with existing land use practices.

The long-term impacts to the natural environment are similar for all Build alternatives and are directly related to their location and mitigative measures. The loss of prime farmland is the only long-term impact which presently cannot be ameliorated by mitigation. The remainder of the environmental parameters assessed can be shown to have beneficial impacts on the project area if suggested mitigation is implemented.

Positive impacts are expected with each of the build alternatives, although the magnitude of these impacts may vary. The impacts include:

- energy savings, principally in reduced yard engine hours

- a more efficient transportation system which will improve transit time through the gateway and improve accessibility within the Illinois portion of the St. Louis SMSA

- land along the Mississippi River cleared for redevelopment, e.g., commercial, residential, and recreational

- improved delivery of public services as a result of improving the transportation system

- enhanced public safety from upgraded facilities, new grade separations, and new fire stations

The proposed Build alternatives will positively impact public safety by providing an upgraded rail system, including several grade separations, which should help decrease the number of rail accidents and reduce the probability of a disaster event. Mitigation measures such as the construction of fire stations in the Madison and Gateway Yards will further improve public safety in the project area.

Only one significant negative socioeconomic impact is expected with the build alternatives, namely a reduction in total employment in the St. Louis metro area. Major differences in the magnitude of this impact occur between the alternatives. By the Year 2000, the Two-Yard Alternative could potentially result in a loss of over 400 jobs; the Three-Yard Directional Alternative could cause a loss of over 500 jobs and, the Three-Yard Bidirectional Alternative may cause a loss of over 900 jobs. In each case, 355 jobs are non-railroad jobs that are lost as a result of the new, more efficient TOFC facility. Additionally, a loss in local business income may occur on the order of $10 to $22 million under the Two- and Three-Yard Directional alternatives, respectively.

The impacts of the reduction in rail jobs on individual workers is softened by six year protection period provisions. At the end of this period, only 5 to 27 workers will lose their jobs under the Two-Yard Directional and Three-Yard Bidirectional plans, respectively. Additionally, several thousand jobs are expected to be created by construction, and one impacts of freeing land for development and an improved rail system is expected to be the creation of new jobs through new and expanded industry, thus further offsetting the anticipated job loss effects.

NATURAL ENVIRONMENTAL - IMPACTS

Air Quality;

Regardless of which of the Build alternatives is selected, during construction, exhaust emissions from construction equipment and vehicles would occur, and dust would be raised by construction and earth-moving operations in the immediate vicinity of the construction sites. The magnitude of air quality impacts resulting from exhaust emissions would be low, limited to the immediate area, and insufficient to cause violation of National Ambient Air Quality Standards. The effects of dust raised through construction activities depend on the efficiency of possible mitigative measures.

No-Build Alternative - by the Year 2000, an increase in rail emissions by approximately 50%, compared with 1979, would be expected. This will still only represent slightly adverse effects on macroscale air quality. Increases in pollutant concentrations adjacent to existing rail yards, and decreases in pollutant concentrations near highway/railroad intersections would also be expected.

Build Alternatives - All Build alternatives would result in an approximately 45% decrease in total pollutant emissions, from 1979 levels, from locomotives within the project area, a beneficial impact on overall air quality. Increases in air pollutant concentrations in new rail yards and decreases at abandoned yards would also occur. Finally, there would be decreases in pollutant concentrations near highway/railroad intersections and at improved Route 3, and minor increases in pollutant concentrations at the entrance to TOFC Yard.

Potential Mitigative Measures - Grade crossing improvements, heavy-duty vehicle restrictions, possibly retrofitting locomotives with pollution control devices, and the planned automotive inspection/maintenance program would all act to mitigate the impacts of the project on air quality.

Water Quality:

Short-term water quality impacts would result from erosion and sedimentation during the construction of the build alternatives. Water bodies potentially impacted would be Schoenberger Creek, the Frank Holten State Park Lakes, Horseshoe Lake, Cahokia Canal, and the Harding Ditch. Measures to control erosion during construction would minimize water quality impacts on the affected streams.

Long-term impacts would be restricted to pollutant runoff to nearby drainage-ways and groundwater. Substances such as fuels, oils, chemical spills, de-icers, and herbicides would be concentrated in the runoff water and could produce a localized, severe impact on the receiving water if no pretreatment exists. All new locomotive and rail car maintenance facilities would be serviced by a waste collection system and an oil-water separator under the proposed project.

Noise Impacts:

Any residence adjacent to an expanded yard, corridor, interlocking, or Route 3 relocation would be exposed to short-term noise and vibration impacts from trucks and machinery used during construction. Adequate measures to minimize or eliminate the noise and vibration impacts of construction at the residential areas would be implemented.

The Two-Yard Alternative would reduce the number of residences exposed to railroad generated noise of over 65 dBA L_{dn} by 18%, the Three-Yard Directional Alternative by 11%, and the Three-Yard Bidirectional Alternative by 9%. The reduction of noise levels would result from the increased efficiency in corridor traffic routing and the construction of noise barriers. Without the proposed noise mitigation, residential areas of Centreville, East St. Louis, Venice, National City, and Brooklyn would be subject to major noise impacts from the new and expanded rail yards. Buildings in Centreville and Brooklyn adjacent to the expanded rail yard facilities would be suject to increased vibration levels.

Natural Systems:

The natural ecosystems within areas of proposed construction have been characterized in the Technical Supplement Natural Systems. The short-term impacts to the natural ecosystems would be disturbance during construction, and temporary loss of habitat before revegetation. These impacts would not be entirely avoided with mitigation. Habitats within or bordering construction areas, which are not altered by excavation, will still be impacted by the noise and close human contact during construction.

The long-term impacts to the natural ecosystems will be a permanant loss of habitat, without mitigation. If suggested mitigative measures are implemented, (i.e., purchase of alternate habitats, revegetation), the habitats available to area wildlife would be managed and improved.

Wetlands and Threatened and Endangered Species:

The present condition of the wetlands proposed to be incorporated into construction is stressed. As outlined in the Natural Systems Technical Supplement, the majority of the wetland areas are less than 1.5 acres in size. Short term impacts to these areas by construction will involve habitat disruption and the siltation of surfact waters, without mitigation. Erosion control techniques and revegetation can eliminate the severity of short-term impacts if implemented as outlined in the Technical Supplement.

The long-term impacts of construction to the wetlands include a partial or total loss of these areas as habitat to local flora and fauna. The wetlands to be incorporated into construction are presently part of the few remnants of the floodplain habitats which once dominated the area. Without mitigation they would suffer more degradation and become less able to support wildlife. However, with the implementation of suggested mitigative measures (i.e. purchase of alternative habitats, erosion control, revegetation and vegetation buffers), these habitats would be protected and in most cases enhanced. If the mitigative measures are carried out, the project would be beneficial to the area's wetlands and wildlife.

The short-term impacts to threatened and endangered species presently cannot be assessed until more detailed reconnaissance of the construction areas is completed in June of 1981. A program is presently being coordinated with the Illinois Department of Conservation (IDOC) and the USDI Fish and Wildlife Service (FWS), to determine the presence or absence of the subject flora and fauna with the areas of construction.

No threatened or endangered species were encountered during preliminary site reconnaissance and there are none of the subject species indigenous solely to this area of the American Bottoms. Habitat preference of the species that may potentially occur in the area, as suggested by the IDOC and FWS, has been compared with existing habitats in the area. Through preliminary site reconnaissance and habitat assessment it appears that the potential for effecting threatened or endangered species is low. Long-term impacts along with mitigation will create more favorable habitats and may even attract and support viable populations within the area.

Earth Sciences:

During construction, the potential for erosion and sedimentation will be greatest, threatening the surrounding farmland and wetlands. However, if the proper soil and sedimentation practices are implemented during all phases of construction, the impact can be lessened. The long-term impacts are negligible once vegetation has been established to stabilize the exposed soil.

The long- and short-term impacts on construction will be a total loss of 250 to 300 acres of prime farmland within the construction site. There are no practical or economical mitigative measures to restore prime farmland once it has been destroyed.

Flood Hazards and Floodplain Management:

Short-term impacts on the floodplain due to construction activity would occur if sediment and debris accumulate in the streams, ditches, and culverts. The water carrying capacity of the drainage system would be reduced, further aggravating the interior flooding problem. Adequate measures to control erosion should be implemented during the construction phase to minimize impacts.

Long-term impacts would result from the filling in of the floodplain in some areas. Residential areas of Brooklyn and Centreville currently not subject to flooding could be impacted under each of the Build alternatives. The incorporation of new drainage facilities with the design of the expanded yards would lessen flooding impacts. All new railroad and highway facilities should preserve the natural drainage and accommodate the water carrying capacity of the existing ditches and canals, in accordance with DOT Order 5650.2, "Floodplain Management and Protection."

Energy Resources:

In the short term, no impacts are expected under the No-Build case, while the three Build alternatives will negatively impact energy consumption during construction. An estimated 398,000 to 424,000 barrels of oil will be consumed per year during the eight-year construction period.

No impacts in the long run are expected under the No-Build situation. The proposed Build alternatives will positively impact fuel consumption by saving between 932,000 to 1,123,000 barrels of oil per year, depending on the alternative considered. This translates into a three-year recapture period and a yearly net savings after the three years for the life of the project.

Use of Natural Resources Other than Energy:

Under the No-Build case, no significant impacts on natural resources are expected in the short term. There will be an irretrievable use of natural resources under each of the build alternatives. Natural resources affected by construction include: wood for railroad ties, steel for rails, dirt for fill, limestone for ballast, concrete, and asphalt.

No significant long-term impacts are expected under any alternative.

HUMAN ENVIRONMENT - IMPACTS

Transportation:

In the short term, the No-Build alternative is expected to worsen vehicular traffic delays resulting from at-grade rail traffic conflicts in the metro area. Construction under any alternative will have a disrupting effect on traffic flow in the study area. Mitigation measures such as identification of alternate routes and detours or by-passes will help to minimize these impacts.

In the long term, the present inefficient transportation system will most likely worsen without the project. Under any of the build alternatives, the transportation system should improve in two important ways. First, improved transit time through the Gateway will benefit shippers and should help draw new industry into the metro area. Second, general accessibility will be significantly improved within the Illinois portion of the SMSA.

Elderly and Handicapped; Minority groups:

No short-term impacts are anticipated on either of these groups under any plan.

No long-term impacts are expected under any alternative.

Land Use:

In the short run, land use is not expected to be significantly impacted; construction activities will impact only small geographic areas in a temporary manner. For example, a temporary access road to a construction site may be built across existing farmland. In the long run, the project will free up land along the Mississippi River for development (e.g., commercial, residential, and recreational). The only other noticeable impact will be the conversion of approximately 250-300 acres of existing farmland to railroad use.

Public Health and Safety:

In the short term, impacts are expected on public health, in the areas of air quality and noise. The physical construction of rail facilties would increase fugitive particulates in the air and increase noise levels. The degree to which these impacts can be mitigated depends on the success of mitigative measures discussed in Chapter 4. There is also some danger of accidents during construction between automobiles and construction equipment; these will be minimized by mitigation techniques such as controlled crossings of construction roadways or detours around construction sites.

Long-term positive impacts on public safety will result with any of the build alternatives. An upgraded rail system should help decrease the number of rail accidents and reduce the probability of a disaster event. Provisions for effective handling of rail accidents, such as fires, are included in the restructuring plan. Improved mobility for emergency vehicles would occur due to construction of grade-separation structures.

Recreational Opportunities:

No significant impacts are expected in the short term.

No major impacts on recreational lands are expected in the long term. While Lee Park in Venice will be impacted by the project, functional replacement of displaced facilities in advance of construction will fully mitigate this project impact.

Locations and Sites of Archaeological and Cultural Significance:

There are only two sites in the area currently listed on the National Register of Historic Places, - the Cahokia Mounds Site in Collinsville, Illinois, and the Eads Bridge, which spans the Mississippi River. Consultation with the Office of the State Historic Preservation Officer has been on-going during the project. It has been determined that neither of these sites would be affected by either the no-build or any of the build alternatives.

Of the eight sites which have been suggested as having potential National Register significance, only three would actually be affected by any of the restructuring alternatives. Both Three-Yard Alternatives would displace the Terminal Railroad Roundhouse and shops, located in Brooklyn, Illinois, and the National City Houses. Since the Two-Yard Plan would only expand Madison Yard, requiring less land, it would not affect these sites.

The third site, the Wabash Roundhouse in Brooklyn, would be affected only by the West Plan for the relocation of Route 3. The interchange with Bend Road in Brooklyn could isolate the roundhouse in a quadrant of the intersection. At the worst, it would not be displaced by construction but only suffer restricted access. The Federal Highway Administration has suggested a redesign of the interchange which might avoid any impact on this roundhouse. This will be examined further during design engineering.

The other five sites discussed previously are located in the riverfront area of East St. Louis. The only project activities which would take place near these sites would be the demolition and clearance of rail facilities from the riverfront. If, however, riverfront development were to occur, the potential for impacting these sites would increase.

After receiving concurrence from the SHPO, detailed analyses of all these sites will be submitted along with a Request for Determination of Eligibility to the National Register. Coordination with the SHPO and the Advisory Council on Historic Preservation will be continued after a Determination of Significance is made. Section 106 case studies will be prepared reflecting this coordination and agreement on suitable mitigation measures.

Possible mitigation measures for these sites include complete data recovery through excavation, archival research and oral history. Architectural documentation would be done in accordance with procedures established by the Historic American Engineering Record (HAER) and the Historic American Buildings Survey (HABS). The possible preservation and rehabilitation of some of the sites has been suggested as a possible mitigation measure. Adaptive reuse of some of the buildings located on the riverfront might be included in efforts to redevelop that area.

Resources identified as part of the expanded archaeological reconnaissance will be treated in the same manner as those evaluated during the testing. Based on recommendations received from the SHPO and the project archaeologists, further testing will be undertaken and results submitted for determination of significance, if necessary.

Construction Impacts:

Short-term construction impacts in the form of general disruptions of daily activity are expected under each build alternative. Most of these will probably impact other categories such as transportation.

No long-range construction impacts are expected.

Displacements:

Approximately 222-251 residential displacements and 32-35 business displacements will occur in the short term under the build alternatives. These are viewed as significant negative impacts which need to be mitigated through an acceptable relocation plan. With such a plan, no significant impact will result.

No long-term displacement impacts are expected as a result of the proposed restructuring project.

Public Services:

Under the no-build condition the delivery of public services in the metro east area will continue to be less than optimal. At present, emergency vehicles experience delays because of the lack of grade separations. In the short run, public services could be temporarily disrupted and until construction of bypasses and grade separations is completed, public services will be negatively impacted under all build alternatives.

The no-build situation in the long run will not improve appreciably (except due to actions that occur with or without the project). Under each build alternative, improved delivery of public services is expected to result from an improved transportation system.

Taxes:

Neither the No-Build nor any build alternative will impact taxes in the short term.

Each Build alternative is expected to cause only minor impacts on total tax revenues (reductions up to three percent). Individual taxing districts will not be impacted equally by the project. While a few districts are expected to receive substantial revenue increases, no district is projected to experience more than a four percent decrease.

Employment:

No impacts are foreseen for the no-build case over the short term. However, for each of the Build alternatives, a significant increase in employment is expected to result from construction. Also, for every new construction job, three additional new jobs will be created in other economic sectors.

Under the no-build situation, no long-term change is expected in railroad employment. For each build alternative, a reduction in railroad employment is forseen as a direct result of restructuring. The addition of a centralized TOFC facility will also negatively impact jobs in the trucking industry. Restructuring will create a more efficient gateway system and at the same time free existing railroad land for redevelopment. Thus, while an updated and more efficient rail system will cause an expected reduction in railroad and truck employment, the potential redevelopment of riverfront land would create new jobs outside the transportation sector. The magnitude of this positive impact cannot be determined at this time; it depends on the type and amount of redevelopment.

Section 4(f) Statement

4(f) DISCUSSION

This section has been prepared pursuant to the requirements of Section 4(f) of the U.S. Department of Transportation Act of 1966, 49 U.S.C. 1653 (f), as amended. The purpose of a Section 4 (f) discussion is to document consideration, consultation and assessment studies which provide data on which to base decisions about the use of land from a publicly owned park, recreation area, or wildlife refuge, or land from an historic site of national, state, or local significance to construct a transportation project. Further, this discussion demonstrates that all of the proposed alternatives have included extensive planning to minimize damage to such public lands.

This discussion presents arguments supporting the restructuring of the St. Louis rail terminal. The yard and corridor improvements described in the Environmental Impact Statement have been proposed as solutions to the problems of delay and congestion in the terminal's operation. In addition, the alternatives developed through the MARGE effort will address the goals and objectives of the communities in the project area with respect to easing local traffic patterns and providing economic development opportunities.

The three restructuring options are each designed to expand the classification and storage capacity of the common carrier yards in the gateway, by adding track. Corridor upgrading will allow faster train speeds, reducing rail transit time through the terminal. The provision of a common trailer-on-flatcar yard for the interchange between truck and rail traffic will streamline this exchange and, at the same time, reduce the level of truck traffic on the local, surface street system. Grade separations to be constructed as part of the project will further reduce congestion and delay for local traffic. Railroad companies which elect to participate in the common TOFC yard will be able to release land now used for individual TOFC operations, enhancing the likelihood of attracting new commerce and industry to an area badly in need of employment.

DESCRIPTION OF 4(f) PROPERTIES

Properties which may be affected by elements of the restructuring alternatives include: a public park in Venice, Illinois; Horseshoe Lake Conservation Area; and one site which is listed on the National Register of Historic Places -- the Cahokia Mounds State Park. In addition, three historic sites which have been identified as potentially eligible for listing on the Register may be affected by one or more of the restructuring alternatives. Areas of prehistoric habitation may also warrant determinations of significance from the Keeper of the Register.

Lee Park, Venice, Illinois:

Lee Park was organized by the City of Venice in 1940 and subsequently acquired by the Venice Park Board from the City in 1972. Named after Dr. Johnny Lee, a local physician, the park is classified as a "district park" and is Venice's only park. Exhibit J shows the layout of the park. The rectangular park site contains 32.16 acres generally bounded by the Merchants Bridge approach on the north, 4th Street on the east, Broadway on the south, and Q-Corridor on the west. Access into Lee Park

is from 4th Street and Broadway. Driveways on parkland are the gravel roads parallel to 4th Street on the east side of the park and a loop dirt road on the west side of the park. Vehicles park along these roads and in parking lots near the city hall and a church on Broadway.

Facilities in the park include two softball diamonds (one with lights and a scoreboard), a baseball diamond, a basketball court, a tennis court, two playgrounds, an open pavilion, picnic tables and two restrooms. Improvements have been made through the use of park bonds; no Land and Water Conservation Funds have been used for Lee Park.

The terrain of Lee Park is level ground on the Mississippi River flood plain and contains no open drainageways or ponds. The park's landscaping consists primarily of deciduous trees and bushes along its periphery and picnic areas, and a grove in the southwest quadrant.

The nearest park facility to Lee Park is the 14-acre Robin Stadium Park located about one mile south in Brooklyn, Illinois. Robin Stadium Park contains a baseball diamond and is owned by the Brooklyn School District 188.

Horseshoe Lake Recreation Area:

Horseshoe Lake is a 2,100 acre natural oxbow of the Mississippi, located in the northern part of the study area in Madison County, Illinois. It is approximately 6 feet in maximum depth and has a regular shoreline which supports extensive wetland vegetation. It is a major detention basin for the Cahokia Canal watershed.

Surrounded by the lobes of the lake is the approximately 960 acre Horseshoe Lake State Recreation Area. The lake is open to public fishing, and waterfowl hunting is permitted on a daily fee basis. Commercial fishing is also carried out on the lake.

Cahokia Mounds State Park:

Lying within the American Bottoms region of North America, the project holds the potential for affecting the area's rich cultural resources. Prehistoric remains are particularly abundant in Illinois, with one of the most important being Cahokia, the 1200 acre mound complex which is all that remains of the earliest "city" in the United States. Cahokia Mounds State Park, a National Register site, is technically outside of the MARGE study area with the exception of a small triangle in the southwest corner which may be affected by a rail connection. Since the investigation of Cahokia using scientific archaeological methods began some three decades ago, numerous satellite settlements have been discovered and related to the mound complex. There is the possibility, therefore, that more of these small sites exist, making the project area an archaeologically sensitive one.

Potential Historic Sites:

Results of the historic survey conducted by Illinois State University identified a number of sites dating to the late 19th and early 20th centuries. Most of these properties were associated with the development of the railroad industry. Archaeological testing was recommended to determine potential historic significance. Of the sites identified, three may be affected by one or more of the Build alternatives:

- National City - An early example of "company housing", this site consists of some 40 houses purchased by the National Stockyards Corporation. National City was incorporated in 1907, ostensibly to control tax rates and property assessments. Local tradition also suggests that the existing houses were on display as model homes at the 1904 St. Louis Exposition.

- Terminal Railroad Roundhouse and Shops - Located at the southeast corner of the village of Brooklyn, this roundhouse complex, which consists of five buildings plus associated track and equipment, was built between 1903 and 1907. The TRRA complex offers an excellent example of early 20th century railroad repair shop construction and machinery that has retained much of its structural and industrial integrity to the present day.

- Wabash Roundhouse - The Wabash Roundhouse, dating to the early 20th century, is located at the jog in Illinois Route 3 directly southwest of Brooklyn. Existing remains of the roundhouse complex include the area's only intact coal tipple, used to fill the coal cars and the sand reservoirs of the steam locomotives.

PROJECT EFFECTS ON THE SECTION 4(f) PROPERTIES

Lee Park:

The "No-Build" alternative will avoid any Lee Park displacements. However, it will fail to handle the rail demand for Mississippi River crossings in the year 2000. In 1979, 89 trains handling 5,005 cars used the double track MacArthur and Merchants bridges. (The single track McKinley Bridge was not in service.) Traffic projections for the year 2000 shows 131 trains handling 11,022 cars will be required to make the river crossing if the three-yard directional alternative is built.

Lee Park is currently impacted by noise from both Q corridor and the Merchant's Bridge approach. The 1979 noise level at the home plate of the southernmost ballfield was 60 dBA (L_{dn}). The level is expected to remain constant in the no-build case.

Any of the Build alternatives would provide the only solution for accommodating additional traffic - additional tracks across the river. One alternative for accomplishing this would strenthen McKinley Bridge and provide additional ingress and egress to the bridge. If this method of providing the additional rail river-crossing capacity were selected for implementation, all build alternatives would affect the park in the same way, since a connection between the Q-corridor to Merchants Bridge corridor in the City of Venice, Illinois is imperative to allow certain essential train mevements to reach and cross McKinley Bridge. This connection from Q-corridor to the Merchants Bridge approach would cut through the northwestern part of Lee Park.

A 190-foot wide railroad right-of-way would be required to build the interlocking connection. This would necessitate acquiring a strip of Lee Park 1128 feet long (4.92 acres) along the north and western edges of the park, and additionally would cause the displacement of 4.09 acres in the northwestern corner of the park which will be rendered inaccessible by the proposed connection (see Exhibit J). Thus, a total of 9.01 acres or about 28 percent of the park will be displaced by this bridge alternative under the proposed project. The displacement would preclude using the park's two softball diamonds and would require removing the basketball court, the pavilion, one playground, the restrooms and a narrow strip of trees on the west side of the park. The loop at the end of the driveway on the west side of the park would also have to be relocated farther south.

Under this bridge alternative, ambient noise at home plate is expected to increase by two decibels. (This point is 400 feet from the proposed interlocking, 800 feet from the Merchant's Bridge approach and 600 feet from Q corridor.) The noise impact is greater as one moves closer to the proposed interlocking. At a point at the base of the proposed embankment (one hundred feet from the interlocking, 500 feet from the Merchant's Bridge approach and 600 feet from Q corridor), the no-build noise level is 64 dB (L_{dn}). This level is expected to increase to 72 decibels under the three build alternatives.

Degradation in air quality is not expected to result from any of the build alternatives. Odor from diesel fuel exhausts may be noticeable within five to ten feet from an engine in the interlocking corridor.

The other alternatives to displacing this park land would either provide a new railroad bridge across the river, or replace the superstructure on Merchants Bridge, thus allowing its two tracks to each carry a fully-loaded unit train, which they cannot currently do. The feasibility of both these options have been explored from both financial and environmental aspects. The Bridge Options discussion in the Appendix of the Environmental Impact Statement gives the details of this study. Consultation with the United States Coast Guard disclosed that navigational hazards could be expected from the construction of a new bridge and further, that the environmental impacts would be severe. The cost of a new structure would be prohibitively high at $89.5 million.

The option of replacing the river spans on Merchants Bridge would have minimal environmental and navigational impacts and no effect on park land. This option would be cheaper than the other bridge alternatives, at $52 million. The feasibility of this option will be explored further during finalization of the EIS.

Horseshoe Lake Recreation Area:

The No-Build plan would produce no impacts on the Recreation Area.

If any of the Build Alternatives are selected the construction of rail connections in the vicinity of the NKP intersection would affect a small portion of wetland on the west side of Horseshoe Lake. The existing curvature of the track is to be substantially reduced, and would, therefore require construction which will infringe upon and into the Lake. Short-term, construction related impacts on water quality could affect this segment of the lake. These would include erosion and possibly leaks or spills from construction vehicles.

The Relocation of Route 3 would also affect Horseshoe Lake, again in terms of water quality. A proposed section is to be built perpendicular to Route 3 to the east and over the western tip of the Lake. The short-term impacts of this road would be construction related. Long-term water quality impacts of the road during normal use would include highway runoff directly into Horseshoe Lake and the possible elimination of recreational activities in the immediate area of the highway.

The small section of wetland to be lost in the southwest corner of the Horseshoe Lake system is dry for most of the year with only a few remnants of wetland vegetation. The cultivation which is encroaching into the area diminishes the impact to be felt from project construction. The potential for endangered species is very low.

Cahokia Mounds State Park:

The No-Build plan would have no impacts on this property. The only effect on the park of the Build Alternatives would be due to the construction of an interlocking modification at the HN Cabin intersection of the Alton and Southern and the Rose Lake rail corridors on the eastern periphery of the project area. This interlocking would be constructed with all build alternatives, providing increased flexibility for trains entering the terminal from the east, allowing them to proceed north without having to be switched. This would reduce congestion through the gateway. It would require the taking of approximately one acre of the park which is currently in grass and weeds. There would be no other effects on the park.

Potential Historic Sites

Of the sites for which determinations of significance will be sought, none would be affected under the No-Build Alternative and only three would be directly impacted by any of the Build Alternatives. The Wabash Roundhouse could be included in a quadrant of the intersection of the relocated Route 3 under the West Plan. The TRRA Roundhouse and Shops would have to be taken if either of the Three-Yard Plans were constructed, as would the houses in National City.

PLANNING TO MITIGATE HARM

Lee Park:

Further study of the option of avoiding impact on this park through implementation of the alternative of replacing the superstructure of Merchants Bridge will be made. If the alternative of strengthening McKinley Bridge is selected, thus requiring the displacement effect, the park facilities affected would be functionally replaced. The Venice Park Board has been involved in planning such a contingency.

Two softball diamonds with 275-foot dimensions or three softball diamonds with 250-foot dimensions can be developed in the approximate area of the existing ball-playing fields. Also, other sites exist in residential areas of Venice that are of sufficient size to provide replacement softball or baseball fields (see Exhibit J). The basketball courts could be replaced adjacent to the tennis courts and the pavilion and playground set near the picnic area, or all of the impacted park facilities could be developed along with the ball diamonds at a different location.

Tree replacement, landscaping, and fencing designs will be developed to reduce visual and noise impacts, and to protect park users from the railroad operations. (Earth berms are not considered a suitable noise mitigation measure because of the considerable right-of-way they would require in the park.) The approximately nine-acre parkland displacement could be replaced with comparable acreage else where in the community. The acreage and facility replacements would be planned and implemented in advance of project construction so that there will be no loss in the use of the park land and recreation facilities. Each of the mitigation measures would be closely coordinated with the Venice Park Board.

Horseshoe Lake Recreation Area:

Measures to reduce the impact of project construction will be included in all construction plans. These include erosion control and revegetation.

Cahokia:

Consultation with the State Historic Preservation Officer and park officials has been initiated. The Illinois Department of Conservation real estate section has examined the Cahokia Park property description to determine the limits of the area needed for the interlocking. Continuing discussion is expected to result in satisfactory arrangements to protect park boundaries and assure that no cultural resources are damaged.

Potential Historic Sites

To mitigate the removal of any historic structure necessitated by the project, detailed records of those structures would be made prior to their removal. As-built plans, photographs, and detailed written description would be compiled pursuant to standards established by the Historic American Engineering Record of the Heritage Conservation and Recreation Service, U.S. Department of the Interior. Other mitigative measures, such as relocation of essential elements, will be explored as necessary and feasible. As noted in the EIS, contact with the State Historic Preservation Officer will be maintained. Compliance with Section 106 of the National Historic Preservation Act nas been initiated. A memorandum of agreement with the Advisory Council on Historic Preservation will be drafted in cooperation with the SHPO to minimize adverse effects on any sites which are determined to be of National Register significance. Compliance procedures will also be undertaken for prehistoric sites affected.

Appendix

ST. LOUIS METRO AREA
RAIL GATEWAY ENTERPRISE
BRIDGE IMPROVEMENT OPTIONS

BACKGROUND

The St. Louis Metro Area Rail Gateway Enterprise proposes improving several of the rail bridges which cross the Mississippi River in the project area. There are currently four such bridges: MacArthur, Eads, McKinley and Merchants.

MacArthur Bridge:

MacArthur Bridge, owned by the City of St. Louis, is a double-tracked, double-decked rail/highway structure built in 1917. It is in excellent condition, although its operation (which is under the control of the MacArthur Bridge Commission) suffers from train holdouts from Gateway Yard. In 1979, 24 trains per day used MacArthur Bridge. The A&S, MRS, MP, TRRA, CR, LN, and AMTRAK all operate over the bridge. Some $4.7 million in rehabilitation is proposed under the SLMARGE project, principally on the bridge approaches. This will extend the life of the structure for the foreseeable future, and enable MacArthur Bridge to handle 70 trains daily in the Year 2000.

Eads Bridge:

Eads Bridge, owned by the TRRA, and built in 1874, is also a double-decked structure, but is no longer used for rail service due to clearance and weight restrictions on the bridge and its west approach tunnel. No improvements to Eads Bridge are proposed.

McKinley Bridge:

McKinley Bridge is a single-tracked, single-deck rail/highway structure belonging to the City of Venice, Illinois. It is no longer in rail service, due to problems with the east approach trestle. The bridge carries a highway lane cantilevered onto each side of the structure, and two more highway lanes down the center of the bridge, with a rail track down the center of the eastbound lane. The rail track provides inadequate clearance for high-and-wide loads, and recent structural investigations note that the bridge load capacity is insufficient to support a fully-loaded unit train or modern six-axle locomotives.

The bridge, built in 1910, operates via tolls on both highway and rail traffic. Currently, the Illinois Terminal Railroad pays the City of Venice a minimum annual lease payment of $200,000 and would pay an additional $1 per car for every car over 200,000 per year if the bridge were in service. In 1988, the minimum lease payment will be reduced to $25,000 per year for 0 to 200,000 rail cars, remaining at $1 per car for every car over 200,000 per year. In 2008, the minimum charge ceases entirely, although there is a provision for extending the lease for another 50 years. It should be noted that the Norfolk and Western Railway is in the process of acquiring the Illinois Terminal, and would assume the responsibility for these lease payments. The effects of the SLMARGE project on this bridge are discussed below.

Merchants Bridge:

Merchants Bridge is a double-tracked rail-only structure built in 1890. The tracks are located on the outside edges of the deck, providing insufficient clearance for high-and-wide loads. Merchants Bridge, owned by the TRRA, is heavily-used, with 66 trains per day in 1979. Fully-loaded unit trains and multiple six-axle locomotives are prohibited from using more than one of the two tracks at a time, due to inadequate load-bearing capacity, thus most of the 66 trains are local industry service of the TRRA. Amtrak, NW, MP, and CR also operate over the bridge, but together comprise less than 25% of the traffic. Merchants Bridge is in need of rehabilitation, and could go out-of-service as early as 1985 without substantial investment, although the age of bridge prohibits exact projections as to its remaining useful life. Improvements to the bridge proposed under the project are discussed below.

BRIDGE NEEDS:

The rail operations analysis performed under SLMARGE projected that 130 trains per day will need to cross the Mississippi River in the Year 2000, a 44 percent increase over 1979. Further, the nature of these trains will change, with much greater emphasis on run-through and unit trains. The analysis demonstrated that there will exist a need for river-crossing capacity equivalent to four full load-bearing tracks in the Year 2000. Only three such tracks - capable of carrying six-axle locomotives and unit trains - currently exist, with two being located on MacArthur Bridge, and the other (subject to clearance restrictions), on Merchants Bridge. Given the pattern of operations in the Gateway, two of these tracks need to be located in the northern end of the study area. Consequently, the project bridge studies revolved around the central need to provide two full-load tracks in that general area.

BRIDGE OPTIONS

Three major options for creating these tracks were developed: constructing a new rail river bridge; completely replacing the superstructure of Merchants Bridge and constructing new connections between the bridge approaches and certain rail corridors to allow all railroads easy and uncongested access to the bridge; and rehabilitating both Merchants and McKinley Bridges to provide one full-load track down the center of each bridge, operating the two as a couple, with the appropriate corridor connections to allow any study area railroad access to either. Each option was found to offer advantages and disadvantages, as discussed below.

New River Bridge:

A totally new bridge across the Mississippi River is estimated to cost \$89.5 million, assuming a location very near to current Merchants Bridge (probably just downstream). A new bridge would offer the advantages of a 100-year life, with double-tracked, six-axle locomotive, high-and-wide load, and unit train capacity. A new bridge would also involve numerous disadvantages, as discussed below.

The disadvantages of a new rail river bridge are the high cost and probable substantial environmental impacts including impacts upon navigation along the Mississippi during its construction and afterwards - unless the existing Merchants Bridge were removed. The costs of removal have not been included in the estimate nor have the additional costs necessary to maintain Merchants Bridge in service during the long design and construction period.

It should be noted that the U.S. Coast Guard, which is responsible for navigation along the River, reacted negatively to the concept of a new bridge when it was presented at an October, 1979 Environmental Scoping meeting. The U.S. Army Corps of Engineers, with permit authority over river crossings, also resisted the concept in early meetings with that agency.

River Span Replacement:

In an effort to avoid some of the costs and adverse impacts of a totally new river bridge, the option of rebuilding existing Merchants Bridge on its existing piers was developed. This option would consist of stripping the bridge down to the piers, then replacing the entire superstructure (the river spans), at a cost of $52.3 million, including $24.8 million for new corridor connections.

The advantages of this option include providing a new superstructure with a 100-year life while reducing costs and impacts from those of a new bridge, and providing a double-tracked bridge with adequate capacity and clearances in one location. Further, it is believed that replacement of the river spans could be accomplished within two years of approval of the Environmental Impact Statement, and could take place in such a way that existing Merchants Bridge would be out-of-service for as little as two weeks. This could be done by constructing the new river spans on land, floating them out to the side of Merchants Bridge on barges, then jacking them up parallel with the existing superstructure on cribbing. Merchants would then be closed, the old superstructure would be rolled out of place and lowered to another line of barges, and the new superstructure rolled into its place.

The disadvantages of this option include the still relatively high cost, the existence of some (although probably short-term) environmental and navigational impacts, and the fact that the option does not address the problems of pier deterioration. The bridge inspections carried out as part of the project found the existing bridge piers to be in good condition, and concluded that rehabilitation work will probably not be necessary over the next 50 years. After that time, there is no question that some work will be necessary. Thus, this option's cost cannot accurately be compared to that of a new 100-year structure, since the need for and cost of pier work cannot be determined at this time. Further investigations of the piers needs to be carried out in the process of finalizing the project's Draft Environmental Impact Statement. Finally, it should be noted that the estimate of $52.3 million includes a "rerouting" cost of about $700,000 to account for Merchants Bridge being closed for two weeks.

Rehabilitate Merchants and McKinley Bridges:

Recognizing that neither bridge could support two full-load tracks on their current superstructures and in looking for ways to reduce the costs and adverse impacts of a solution to the bridge problem, a third option was developed. A compromise would be to rehabilitate each so that it can support one full-load track, then operate the two bridges as a couple - i.e. as there were one bridge. The bridge analyses found that this could be accomplished at minimal cost, by placing a third track down the center of each bridge and by strengthening the bridge floors and trusses. The overall cost of this option would not be minimal, however, because of the need for construction of multiple new approach connections to adjacent rail corridors, so that any railroad in the area could easily access either bridge. These corridor connections would cost $51.3 million; the option's total cost is estimated at $61.5 million.

The advantages of this option include the minimum to non-existent environmental and navigational impacts, the opportunity to make maximum use of existing facilities, and the flexibility it offers. With three River bridges, the potential impacts of any one bridge going out-of-service (due to a serious derailment, or to a barge striking the piers), would be greatly lessened. In addition, the future flexibility of the Gateway would be enhanced by offering an additional river crossing point in the Gateway. Besides placing one full-load track down the center of each bridge, the existing two rail lines on each bridge would be retained. Thus, as many as four light trains or industry moves could cross over the two bridges at once.

The disadvantages of this option include the fact that it would not provide a 100-year bridge. Substantial rehabilitation would be required on these older bridges to keep them in service past 50 years, although it must be mentioned that MacArthur Bridge is in excellent condition, despite being over 60 years old, and should last indefinitely with proper maintenance. Other disadvantages include the loss of the two center highway lanes on McKinley Bridge, and the need for the expensive additional approach work noted above to bring McKinley in service. One of these approaches would displace parkland in Venice, requiring a "4-f" permit and mitigation through replacement of the parkland and facilities. The costs for this replacement have been included in the costs for this option shown above.

A highway capacity analysis has been performed on McKinley Bridge; it was determined that the remaining two highway lanes would be adequate to serve projected demand through the Year 2000. One reason for this is that a rail/highway grade crossing on the east approach to the bridge would be eliminated (i.e. the highway and the rail line would be grade-separated) under the rehabilitation plans. Another reason is that the rail track runs down the center of one of the two center highway lanes. Thus, one lane was unusable, and the other understandably was avoided by traffic when the bridge was in rail use. In effect, the rehabilitation of McKinley Bridge would "trade" four bad highway lanes for two fairly good lanes.

Finally, the option of postponing the opening of McKinley Bridge, instead rehabilitating only Merchants Bridge first, then proceeding to rehabilitate McKinley when traffic levels demand, was examined. Under this sub-option, Merchants Bridge would be rehabilitated and two connections between the bridge approach and Q corridor would be constructed (in the northwest and southwest quadrants of their intersection). The major advantage to this option is its comparatively low cost, at $27.6 million. It would not result in achieving the goal of two additional full-load tracks. One would be placed down the center of Merchants, with the option of continuing the improvement by including McKinley Bridge, as above, considered later as traffic loads grew.

The principal disadvantage of this option is that the rehabilitation could not be performed under traffic. Instead, Merchants Bridge would have to be closed to rail traffic for nine months to one year. The additional operational costs of rerouting rail traffic around the bridge would be on the order of $18 million per year, giving a total cost for this option of $40-45 million, depending on how quickly construction could occur, and not including the need to continue with the McKinley Bridge improvement and other corridor connections at some later date.

SUMMARY

After careful consideration of all of the data and studies produced, the option of replacing the river spans on Merchants Bridge is recommended for further study. The new river bridge is not recommended due to its impacts and cost; the rehabilitation of McKinley is not recommended due to the fact that the solution would not result in structures with long lives, merely postponing the time when a new structure must be considered; and the suboption of doing Merchants first was discarded due to the major impacts of closing that bridge to traffic. In sum, the option of constructing a new superstructure should be studied, because being able to obtain a 100-year-life bridge (save for possible pier work), at lower cost, is attractive. The table below summarizes the projected usage of Merchants Bridge, or the Merchants/McKinley couple, in the Year 2000.

RAILROADS USING
NORTH BRIDGE(S)
IN THE YEAR 2000

RAILROAD	TRAINS/DAY	CARS/DAY
BN/SLSF	15	1306
NW	11	970
IT	3	143
MP	4	307
MKT	2	200
TRRA	17	1101
CRIP (SSW?)	2	253
AMTRAK	6	29
TOTAL	60	4309

For the broad major objectives of the project to be realized, the Phase II work effort has had to identify and resolve a wide range of institutional, social, economic, and environmental concerns in a manner which allows interested private, governmental, and citizens groups and individuals to voice and resolve their concerns. Developing an action acceptable to all, has necessitated the active participation of all interests in the project's Community Involvement Program (CIP).

The overall goal of the CIP is to develop and implement participation techniques which maximize local public/private input. Four major groups whose participation in the Phase II effort was seen as essential to meet the project's goals and objectives were identified early in the project:

- The public sector, composed of local, state, and federal entities whose approval and support will be required for the project.
- The railroads which operate the system.
- The business sector, composed of those businesses and constituents who will be directly impacted through their use of transportation services.
- The citizens in the Project area.

In order to structure the participation and input of the various groups, an organizational framework was established, based on five primary committees:

1. Railroad Steering Committee (RSC): Comprised of the chief executive officers of the various railroads operating in the St. Louis Railroad Gateway Terminal. This Committee provides policy direction for the rail restructuring component and, in cooperation with the Public Agency Steering Committee, offers overall policy direction for the total effort. Periodic meetings, at major decision-points, have been held throughout Phases I and II.

2. Railroad Technical Advisory Committee (RTAC): Comprised of operating or technical officers of the various railroads operating in the Gateway Terminal, as appointed by the RSC. The RTAC reports directly to the RSC and recommends specific actions. The RTAC is the primary focus for railroad input and decisions on engineering, operations, and the overall environmental impact statement. Monthly meetings have been held throughout the planning process.

3. Public Agency Steering Committee (PASC): Comprised of (1) key elected and appointed officials from Illinois, Missouri, and the federal government; (2) representatives of private sector interests; and (3) the regional planning agencies. The PASC, with the RSC, provides the policy guidance for the Project. Quarterly meetings are held in addition to periodic informational mailings.

4. Public Agency Technical Advisory Committee (PTAC): Comprised of (1) the technical representative of each member of the PASC; (2) the technical representatives from other localities potentially impacted by the Project (as appointed by area officials); and (3) the chairperson of the Citizen's Advisory Committee (discussed below). The PTAC reports to the PASC concerning specific actions the PASC needs to take in fulfilling it policy responsibilities. Monthly meetings have been held, for the most part. The PTAC play a significant role in defining the range of rules, regulations, mitigation options and technical assistance available in developing the Environmental Impact Statement.

5. Citizen's Advisory Committee (CAC): Comprised of citizen representatives of each of the communities affected by the project in the Metro-East area. The citizens were selected based on their understanding of the issues or problems experienced by their communities and the entire area. The composition of the Committee was determined by suggestions from local political leaders, neighborhood and religious organizations, and civic and environmental groups. One of the primary roles of the CAC has been to identify the impacts of the project on the areas involved. In addition to meeting quarterly, members of the CAC also serve along with the project staff, as informational resources for area civic, religious, social, and union organizations in the area, explaining the project and soliciting comments.

Community Information Dissemination

Several techniques were used to disseminate information about the project and to generate interaction among the various groups and area citizens, as discussed below:

- Newsletters were published in April and September of 1980 and in March of 1981. A fourth newsletter will be issued in May of this year and will contain articles on the Environmental Impact Statement and on railroad restructuring preferences. These newsletters served to keep interested parties informed on the project progress and activities and to announce upcoming meetings.

- Audio-visual presentations including slides and videotapes were produced for use at meetings to give an overview of the MARGE project. They provided information on the history of the St Louis Rail Gateway and on the project's goals. The videotapes were particularly useful in stimulating discussion on potential redevelopment ideas for the Metro East riverfront.

- Progress reports on the required environmental studies were issued to all committees on a regular basis to summarize project activity for the period and to record financial expenditures. Committees were convened at intervals to conduct workshops as events developed which were relevant to their particular area of interest.

- Informational meetings for the general public were scheduled in each community. Two series of meetings were held in April and in September of 1980 in Centreville, Sauget, East St. Louis, Venice, and Brooklyn, Illinois and in St. Louis, Missouri. A third round of meetings was conducted in March, 1981. The MARGE staff has also been meeting on a continuing basis with Chambers of Commerce, major employers, state legislators, area planning commissions, local mayors and civic groups to give presentations on the progress of the project.

- Survey - In an effort to inform people about the program and to find out how they saw it affecting them, a house-to-house survey was conducted in May, 1980. Area college students canvassed residences in East St. Louis, Venice, Madison, Cahokia and surrounding communities. Results of the survey were tabulated to give the staff a better insight into how the project is perceived by the communities. 79% of area residents were of the opinion the consolidating the rail yards and improving grade crossings would improve their communities. 95% of those responding voiced the belief that the project would bring more jobs and a stronger economic base to the entire area.

- Finally, news media coverage was relied on heavily to provide the public with information about the MARGE project. The project has been featured in nearly all of the area newspapers and on television and radio community affairs programs.

As public information meetings were scheduled, all media carried reports of locations, times and results. Fliers, maps and meeting notices have been widely distributed in the neighborhoods through churches, civic groups and schools.

The effectiveness of the Community Involvement Program can be demonstrated by the issues consistently raised, and by the extent to which these issues have been addressed in this Environmental Impact Statement. The most commonly voiced concerns were:

- Relocating homes to acceptable areas
- Preserving the integrity of neighborhoods
- Consolidating rail traffic to the fewest corridors possible and eliminating delay by building grade separations
- Increasing local government tax revenues
- Retaining relocated businesses within each community
- Reducing exposure to railroad noise, air pollution, and to the risk of hazardous materials transport
- Assuring public involvement in planning for business and employment opportunity.

These concerns, and the aspirations of area residents and businesses for the community development potential of the MARGE project will continue to be structured into the alternatives analysis review process and eventual project implementation.

"Scoping" is the process developed by the Council for Environmental Quality and implemented by the U.S. Department of Transportation through regulations specified at 49 U.S.C. 1501.7. A project is presented to all affected Federal, State and local agencies and all identifiable individuals and organizations for their assistance in developing the significant issues and applicable laws, permits and regulations pertaining to the project's implementation. The purpose of scoping is to confirm that a project Draft Environmental Impact Statement addresses all the relevant facets of design engineering and the impact of the project's construction phase and implementation on the social, economic and natural environment where the project occurs.

The MARGE Project Scoping Process began with letters of invitation to a meeting in East St. Louis on November 29, 1979. Invitations were sent to 17 federal agencies by the Federal Railroad Administration, with letters to 16 mayors, eight township officials, three county chairmen, nine state agenices, two universities, four area planning commissions, nine state legislators, four area utility companies, three port district administrators, seven business, trade and union councils, two environmental groups and five neighborhood development and community action organizations from the Project office. Table I lists all agencies and organizations invited to scoping meetings. In addition, notices of the scoping meeting were published in the Federal Register, the Southern Illinoisian as the State newspaper of public record for the current year, and in newspapers in both St. Louis and the Metro East area of Illinois. Thirty-three people attended the initial scoping meeting to express interest and direction, to inform the Project staff and consultants of review process expectations, and to establish liaison relationships. Four agencies did not attend, but sent letters overviewing their regulatory responsibilities and requesting that further correspondence and the Draft Environmental Impact Statement be forwarded to a designated staff reviewer.

Letters were sent to the entire scoping meeting invitation list following the meeting, thanking participants for their assistance and beginning an ongoing Project development and review relationship. Non-attending agencies were asked to respond as to their continued interest in the project, and those few agencies reporting their expected lack of involvement or review authority in the MARGE Project were dropped from future mailing lists. Some agencies and organizations asked to be kept on all informational mailing lists, some also asked to be notified of all public meetings, and others requested that they only be contacted again when the Draft EIS was published.

During the next 15 months, the interested agencies were integrated into the consultant studies development and review process. Agency data requirements were confirmed and technical reports structured to address the issues raised by the reviewing authorities. Citizen groups and others were advised of the Project's development as the planning process continued, through appointment of a representative to one of the planning review committees or through periodic mailings.

A second round of scoping meetings was conducted in January, 1981, to present the interim list of technical studies and to discuss the depth of analysis being developed in different subject areas. Meetings were held in East St. Louis for local, state and regional scoping process participants, and in Washington, D.C., for federal officials including the Federal Railroad Administration. One hundred and twenty-three invitations were issued, and over 40 scoping participants attended the second set of meetings, offering further technical assistance and direction.

The scoping process technically concludes with the distribution of the Draft Environmental Impact Statement, and the receipt of comments and directions which will be incorporated into the Final Environmental Impact Statement.

TABLE I

SCOPING PARTICIPANTS
THROUGH THE FEDERAL RAIL ADMINISTRATION
AND ILLINOIS DEPARTMENT OF TRANSPORTATION

FEDERAL:	U.S. Department of Commerce
	- Economic Development Administration
	U.S. Department of Agriculture
	U.S. Department of Health and Human Services
	U.S. Department of Housing and Urban Development
	U.S. Department of the Interior
	- Heritage Conservation & Recreation Service
	- Fish and Wildlife Service
	U.S. Department of Energy
	U.S. Department of Transportation
	- Federal Highway Administration
	- Federal Aviation Administration
	- Urban Mass Transit Administration
	- Coast Guard
	U.S. Environmental Protection Agency
	Interstate Commerce Commission
	Council on Environmental Quality
	Advisory Council on Historic Preservation
	U.S. Army Corps of Engineers
	Upper Mississippi River Basin Commission
	- Community Services Administration
STATE:	Illinois Emergency Services and Disaster Agency
	Missouri Highway and Transportation Department
	Southern Illinois University
	Illinois Department of Transportation
	- Division of Highways
	- Division of Water Resources
	Illinois Department of Commerce and Community Affairs
	Illinois Department of Conservation
	Illinois Department of Corrections
	Illinois Department of Agriculture
	Illinois Department of Mines and Minerals
	Illinois Department of Public Health
	Illinois Capital Development Board
	Illinois Commerce Commission
	Illinois Environmental Protection Agency
	Illinois Institute of Natural Resources
	- State Water Survey
	- Illinois Archaeological Survey
	- State Geological Survey
	- Natural History Survey
	University of Illinois
	Missouri Department of Natural Resources
	Illinois State University

LOCAL:

City of Alorton, Illinois
City of Brooklyn, Illinois
City of Cahokia, Illinois
City of Centreville, Illinois
City of Dupo, Illinois
Village of East Carondelet, Illinois
City of East St. Louis, Illinois
City of Fairmont, Illinois
City of Granite City, Illinois
City of Madison, Illinois
City of National City, Illinois
Village of Sauget, Illinois
City of Venice, Illinois
Village of Washington Park, Illinois
City of Pontoon Beach, Illinois
Canteen Township, Illinois
Centreville Township, Illinois
East St. Louis Township, Illinois

St. Clair Township, Illinois
Stites Township, Illinois
Sugar Loaf Township, Illinois
Nameoki Township, Illinois
Granite City Township, Illinois
Venice Township, Illinois
Madison County, Illinois
St. Clair County, Illinois
City of St. Louis, Missouri
St. Louis County, Missouri
St. Louis Regional Commerce and Growth Association
Bi-State Development Agency
Building and Construction Trades Council
East St. Louis Chamber of Commerce
East St. Louis Neighborhood Development Corporation
East Side Sierra Club
East-West Gateway Coordinating Council
Illinois American Water Company
Illinois Bell Telephone Company
Illinois Power Company
LaClede Gas Company
Land of Lincoln Legal Assistance Foundation
Metro East Business Association
Metro East Sanitary District
National Association for the Advancement of Colored People
St. Louis Port District
St. Louis Traffic Club
Southern Illinois Building & Construction Trades Council

SCOPING PARTICIPANTS (continued)

Southwest Port District
Southwestern Illinois Metropolitan & Regional Planning Commission
State Community College
Target 2000 Task Force
Tri-City Regional Port District
Union Electric Company
Urban League of St. Clair County
Sierra Club
St. Louis Business Resource Center
Cahokia Mounds Historical Site

Various federal and state agencies had scoping participation contacts through both central and regional offices.

LIST OF PREPARERS

The document was prepared by the Illinois Department of Transportation under contract to the Federal Railroad Administration with the assistance of a consortium of Sverdrup & Parcel, Envirodyne Engineers, Incorporated and Lester B. Knight. Specialized contributions were also made by the firm of Linton & Company and WAPORA, Inc. The technical analyses were performed by or under the direction of the following persons:

A. FEDERAL RAILROAD ADMINISTRATION

Name	Participation	Experience	Education
Ms. Marilyn W. Klein	Environmental Specialist	Twelve years experience in environmental and land use analysis and environmental planning.	B.A., Wheaton College; M.S. Bank State College
Mr. William R. Fashouer	Attorney/Advisor	Two years experience in environmental review and legislation.	B.A., Indiana University of Pennsylvania, 1976; J.D., Georgetown University.

B. ILLINOIS DEPARTMENT OF TRANSPORTATION

Name	Participation	Experience	Education
Merrill Travis	IDOT Project Manager	Fourteen years of experience in highway and railway engineering and analysis.	B.A., M.P.A., Sangamon State University, Ph.D. student in Civil Engineering, Northwestern University
Jeanette Claflin	EIS Production	Ten years experience in transportation planning and anthropology.	B.A., M.A., Anthropology, Florida Atlantic University

C. RON M. LINTON & COMPANY

Name	Participation	Experience	Education
Keene Taylor	Review & Coordination	Twenty-two years experience in government and private industry in management, and information systems.	B.E. Chemical Engineering, Yale U., 1957, M.B.A. Business Administration, Harvard U., 1959

D. SVERDRUP - ENVIRODYNE - KNIGHT (Project Consultant)

Name	Participation	Experience	Education
Charles G. Hammond	Project Manager	Thirty-four years experience in railroad engineering maintenance and operations.	B.S. Civil Engineering, Virginia Polytechnic Institute and State University, 1947.
Darcy Sullivan	Deputy Project Manager	Twenty-one years experience in transportation engineering with major efforts in safety and evaluation of community impacts.	B.S., Civil Engineering Michigan State University, 1959; M.S. Transportation Engineering, Northwestern University, 1961.
John McCarthy	Socio economic and Land Use	Eight years experience on planning and environmental evaluation.	Master on Urban Planning, Michigan State University, 1972; B.S. Economics, St. Louis University, 1970.
Jeanne Wendel	Socio-economic	Three years experience economic research and and teaching.	Ph.D. Economics, Southern Methodist University, 1977; B.A. History and Economics, Rice University, 1973.
David Becker	Socio economic and Land Use	Five years experience in Socioeconomic research teaching.	Ph.D., Geography, University of Illinois, 1977; M.A. Geography, Mankato State University, 1973; B.S. Geography, Mankato State University, 1968.
Sharon DeSha	Economics	Five years experience research and teaching.	M.A. Economics, Washington University, 1970; B.A. Economics, University of Missouri, St. Louis, 1968.

D. SVERDRUP - ENVIRODYNE - KNIGHT (Project Consultant)

Name	Participation	Experience	Education
Max Gricevich	Ecology	Eight years experience in environmental analysis and environmental planning.	M.S., Biology, Southern Illinois University,1973; B.S., Biology, Augustana College, 1965.
Joseph R. Rowe	Ecology	Four years experience in ecology and water quality.	M.S., Zoology, Eastern Illinois University, 1977; B.S., Environmental Biology, Eastern Illinois University, 1974.
Timothy M. Krause	Noise	Four years experience in noise studies and environmental impact studies.	M.S., Environmental Systems Engineering, Clemson University, 1977; B.S., Environmental Science, Rutgers University, 1976.
Tim Shppensteel	Water Quality	Four years experience in water quality and environmental impact studies.	M.S.E.S., Impact Analysis/ Water Resources, Indiana University, 1977; B.S., Agriculture, Purdue University, 1975.
Donald R. Monnot	Geology, Soils	Six years experience in geology, hydrogeology, environmental impact studies.	M.S., Water Resources Management/Geology, University of Wisconsin, 1975; B.S., Geology University of Wisconsin, 1973.
R.Richard Snarski	Soil Studies	One year of experience in soil and solid waste studies.	M.S., AGronomy, University of Illinois, 1980; B.S., Agronomy, University of Connecticut, 1978.

D. SVERDRUP - ENVIRODYNE - KNIGHT (Project Consultant)

Name	Participation	Experience	Education
Thomas M. Lachajczyk	Air Quality	Seven years experience in air quality and meteorological studies.	M.S., Professional Meteorology, St. Louis University, 1974; B.S., Professional Meteorology, St. Louis University, 1971.

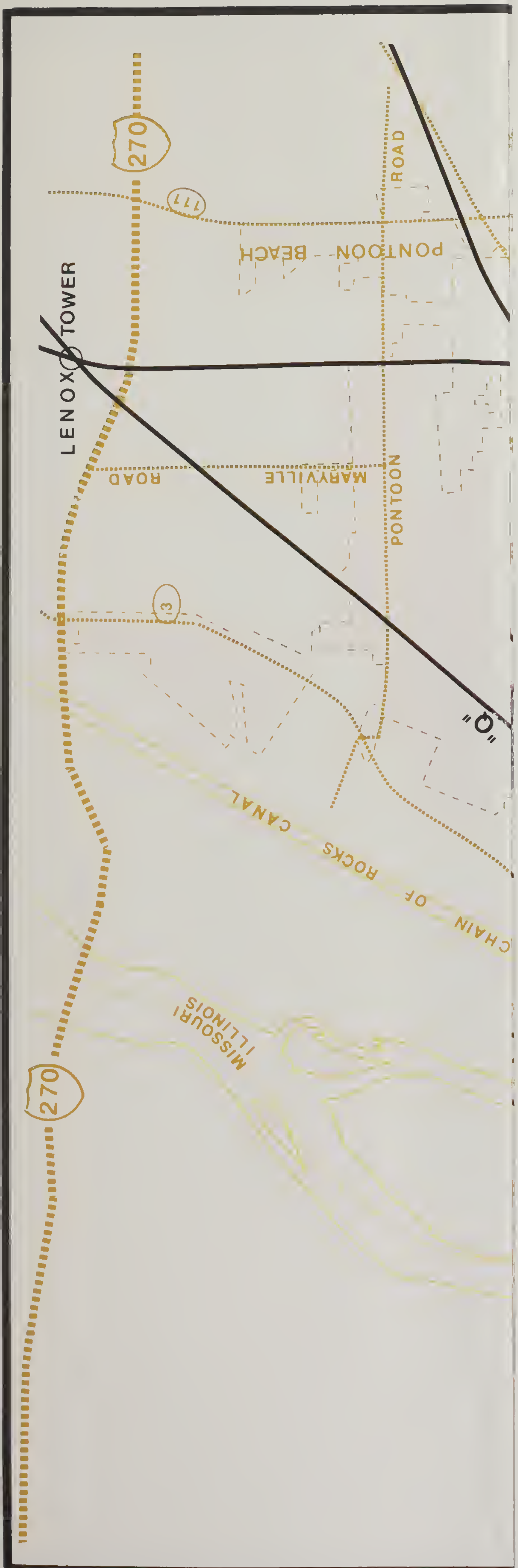
E. WAPORA, INC. (Archaeological Consultant)

Name	Participation	Experience	Education
Marlesa Gray	Archaeological Project Manager	Eight years experience in archaeological field work and report preparation, including two years project review IAS - Atlanta	B.A., Anthropology, Indiana University, 1978; M.A., A.B.D., Michigan State University, 1978
Ishmael Williams	Field Manager	Eight years experience in field work and report preparation	B.A., Biology, B.S., Anthropology, Shorter College
T. Robins Brown	Historical Archaeologist, Architectural Historian	Eight years experience in historic archaeology and Architectural History	B.A., History, Mount Holyoke College; M.A., Architectural History, University of Virginia
Field Curry	Industrial Archaeologist,	Twenty-five years railroad systems engineering, and design, five years independent consulting in industrial archaeology	B.S., Electrical Engineering, University of Arizona, 1947;

LIST OF EXHIBITS

EXHIBIT A

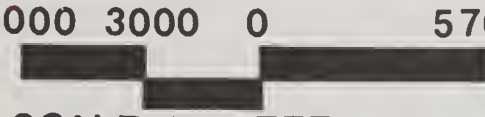
STUDY AREA



VICINITY MAP

LEGEND

ROUTE 3 RELOCATION AREA
RAILROADS
INTERSTATES
PROPOSED RAILROAD YARD
CITY STREETS
EXISTING RAILROAD YARD



SCALE IN FEET

ST. LOUIS MARGE PROJECT
SVERDRUP / ENVIRODYNE / KNIGHT

EXHIBIT A

STUDY AREA

VICINITY MAP

LEGEND

ROUTE 3 RELOCATION AREA	
RAILROADS	
INTERSTATES	
PROPOSED RAILROAD YARD	
CITY STREETS	
EXISTING RAILROAD YARD	

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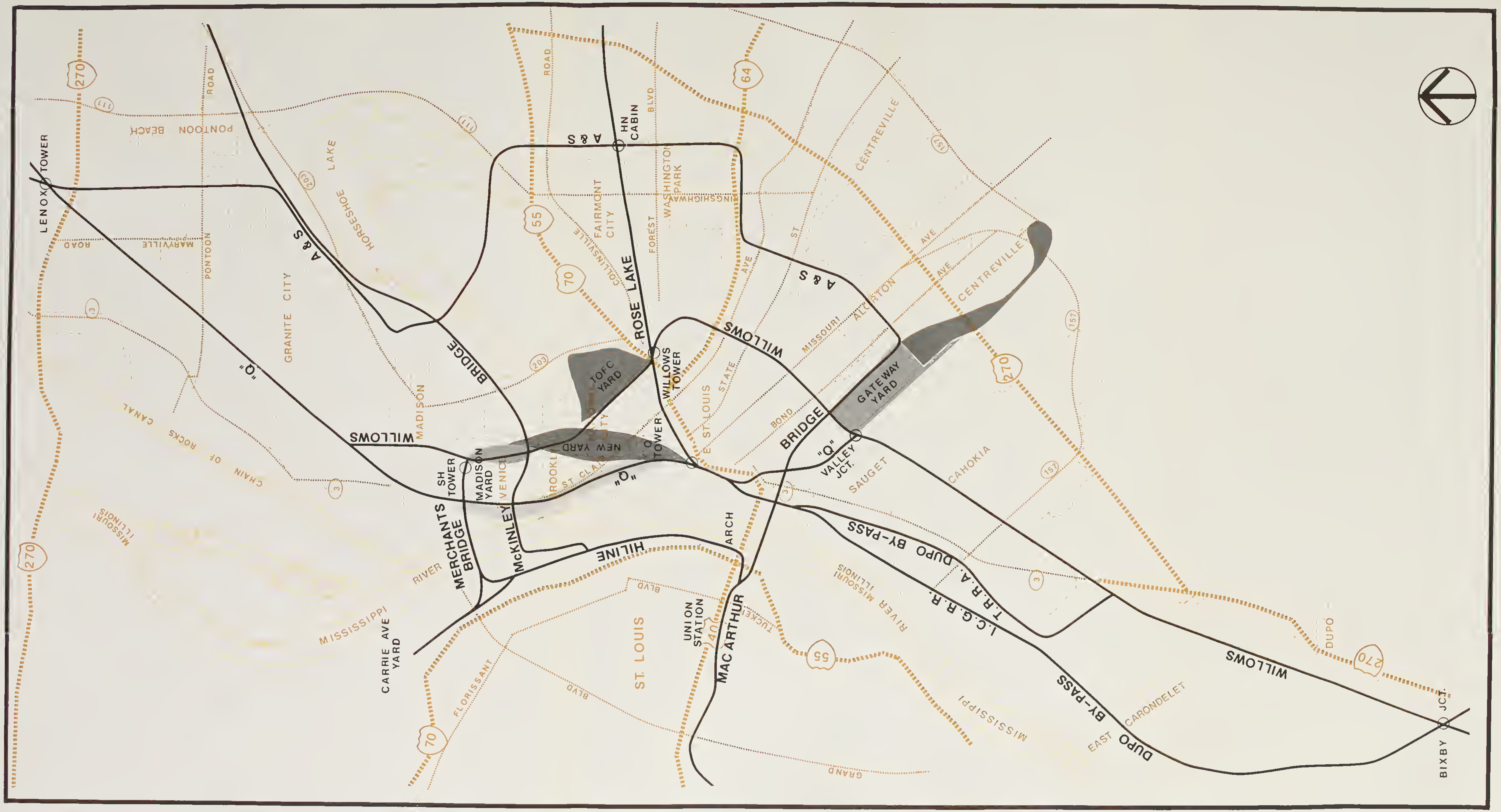
SCALE IN FEET



ST. LOUIS MARGE PROJECT
SVERDRUP/ENVIRODYNE/KNIGHT

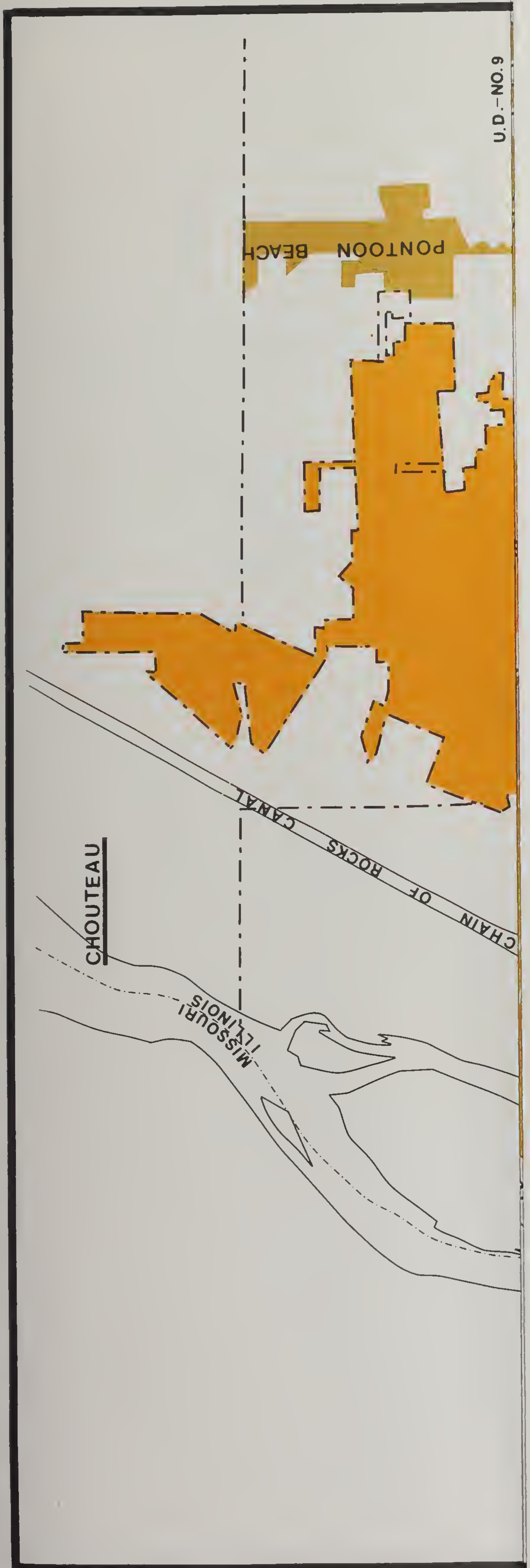


EXHIBIT B

MINOR CIVIL DIVISIONS

VICINITY MAP

LEGEND

COUNTY LINE
TOWNSHIP LINE
SCHOOL LINE
EXISTING RAILROAD YARDS
PROPOSED RAILROAD YARDS

6000 3000 0 5700

SCALE IN FEET

ST. LOUIS MARGE PROJECT
SVERDRUP/ENVIRODYNE/KNIGHT

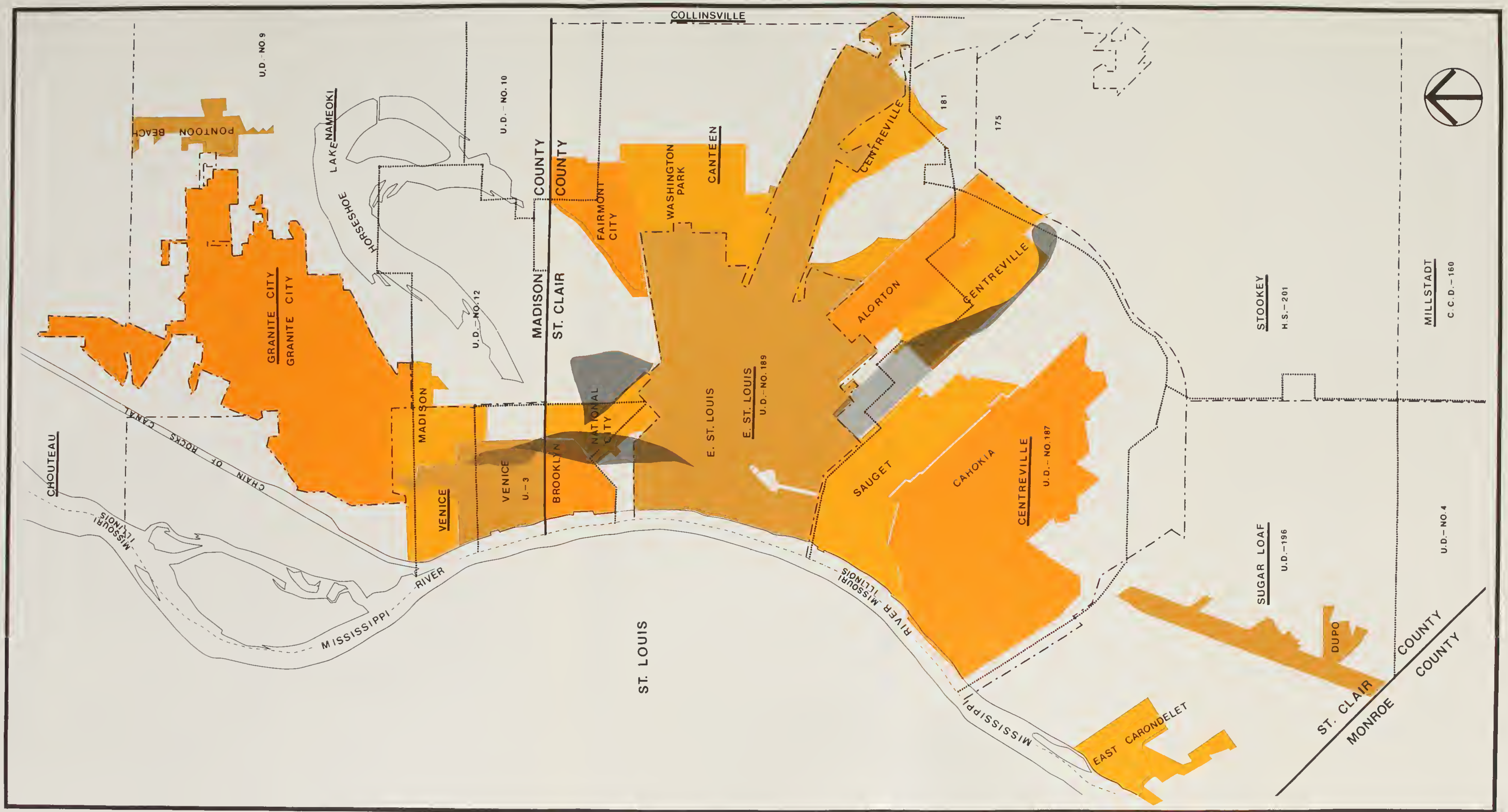


EXHIBIT B

MINOR CIVIL DIVISIONS

VICINITY MAP

LEGEND

COUNTY LINE
TOWNSHIP LINE
SCHOOL LINE
EXISTING RAILROAD YARDS
PROPOSED RAILROAD YARDS

6000 3000 0 5700

SCALE IN FEET

ST. LOUIS MARGE PROJECT
SVERDRUP/ENVIRODYNE/KNIGHT

EXHIBIT C

GRADE SEPARATIONS

2000 TWO YARD &
THREE YARD DIRECTIONAL

VICINITY MAP

LEGEND

RAILROAD TRACKS
CITY STREETS
INTERSTATE

GRADE SEPARATION
STRUCTURE NO. 00

6000 3000 0 5700

SCALE IN FEET

ST. LOUIS MARGE PROJECT
SVERDRUP / ENVIRODYNE / KNIGHT

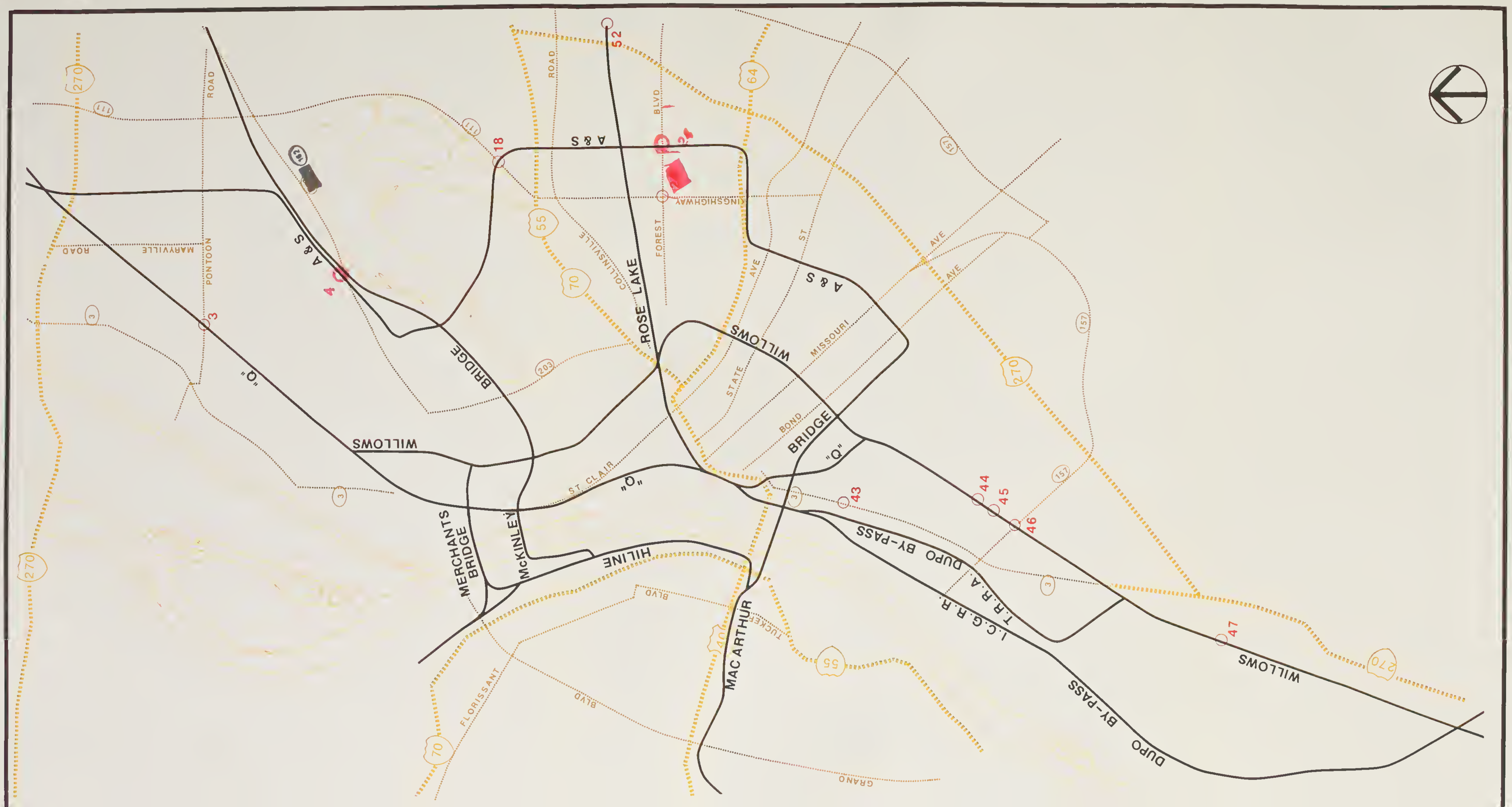


EXHIBIT C

GRADE SEPARATIONS

2000 TWO YARD & THREE YARD DIRECTIONAL

VICINITY MAP

LEGEND

RAILROAD TRACKS	
CITY STREETS	
INTERSTATE	
GRADE SEPARATION STRUCTURE NO.	00

6000 3000 0 5700

SCALE IN FEET

ST. LOUIS MARGE PROJECT

SVERDRUP / ENVIRODYNE / KNIGHT

EXHIBIT D

GRADE SEPARATIONS

2000 THREE YARD
BI-DIRECTIONAL

VICINITY MAP

LEGEND

RAILROAD TRACKS	
CITY STREETS	
INTERSTATE	
GRADE SEPARATION STRUCTURE NO.	00

6000 3000 0 5700

SCALE IN FEET

ST. LOUIS MARGE PROJECT
SVERDRUP / ENVIRODYNE / KNIGHT

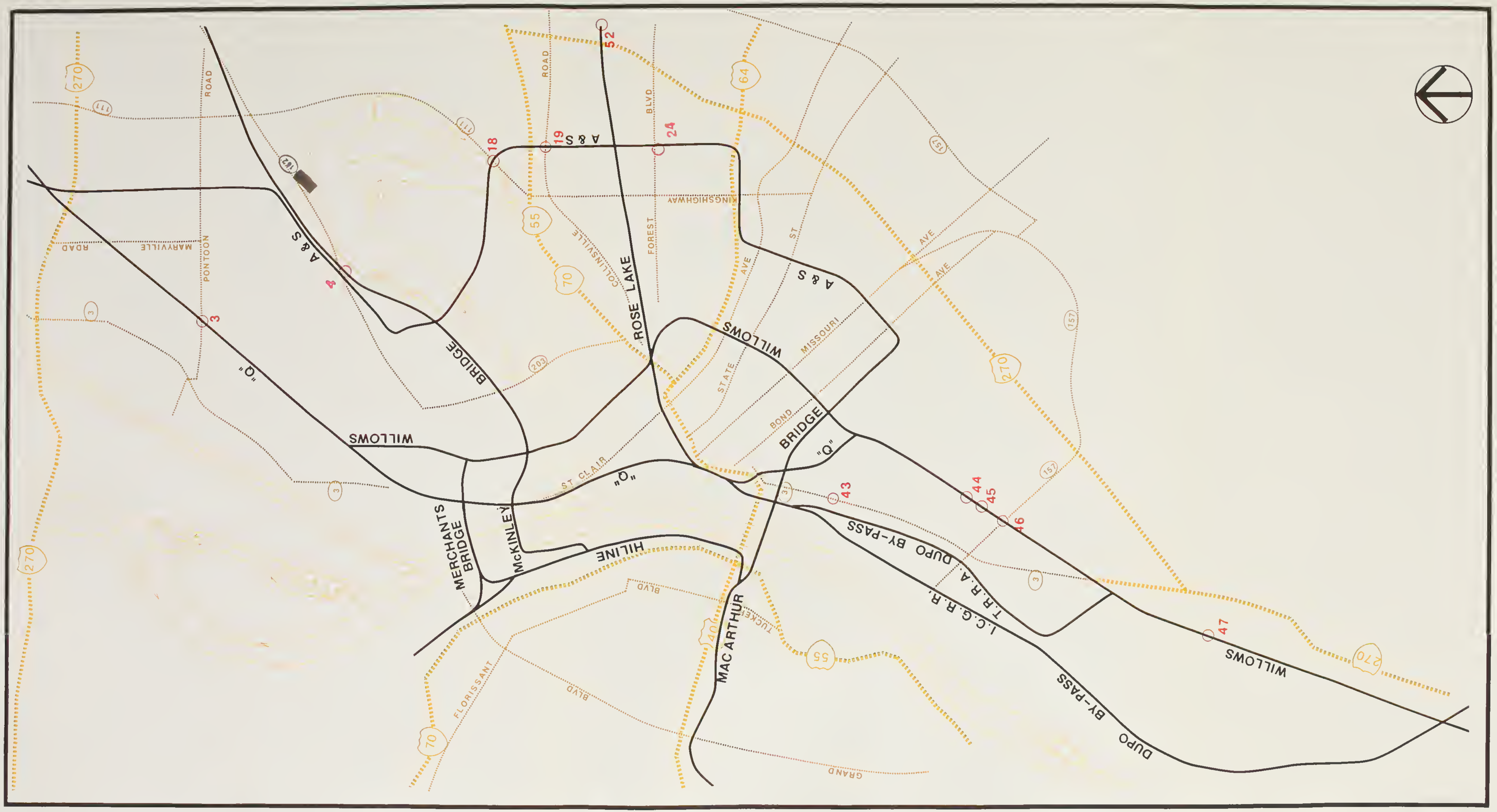


EXHIBIT D

GRADE SEPARATIONS

2000 THREE YARD
BI-DIRECTIONAL

VICINITY MAP

LEGEND

RAILROAD TRACKS
CITY STREETS
INTERSTATE

GRADE SEPARATION STRUCTURE NO. 00

6000 3000 0 5700

SCALE IN FEET

ST. LOUIS MARGE PROJECT
SVERDRUP/ENVIRODYNE/KNIGHT

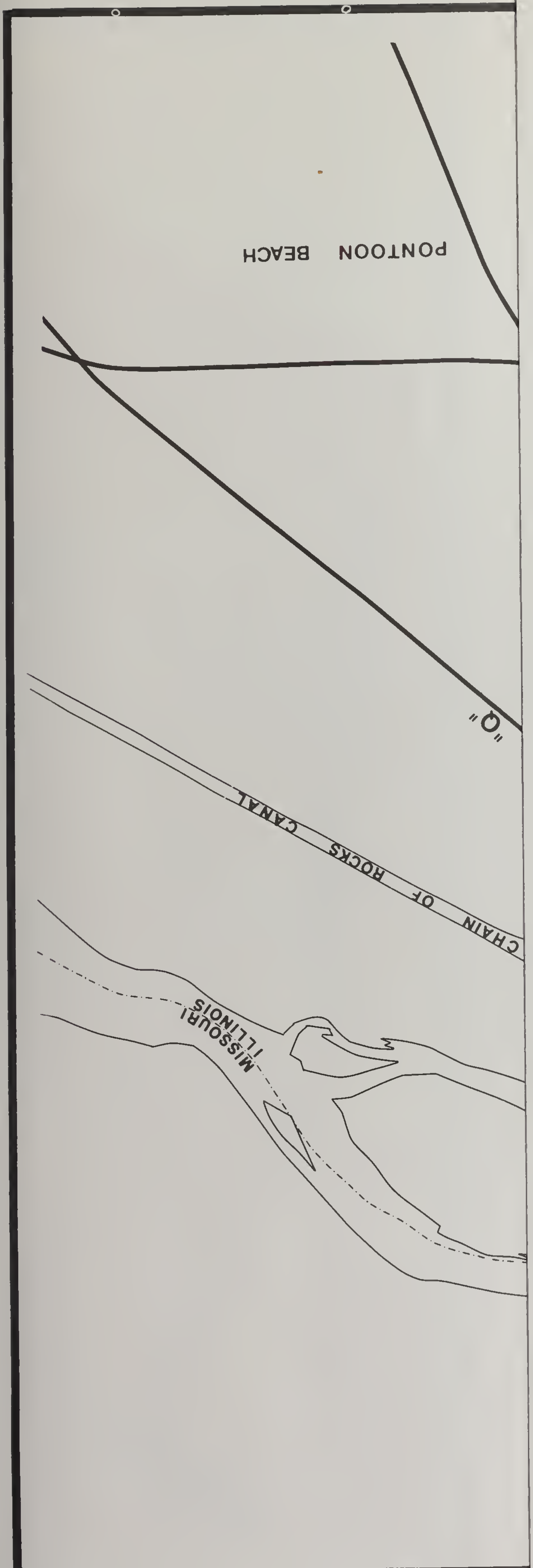


EXHIBIT E

AFFECTED NATURAL ENVIRONMENTS

VICINITY MAP

LEGEND

RAILROAD TRACKS
WATERWAYS
PRIME FARMLAND
SENSITIVE HABITAT
EXISTING RAILROAD YARDS
PROPOSED RAILROAD YARDS

6000 3000 0 5700

SCALE IN FEET

ST. LOUIS MARGE PROJECT
SVERDRUP / ENVIRODYNE / KNIGHT

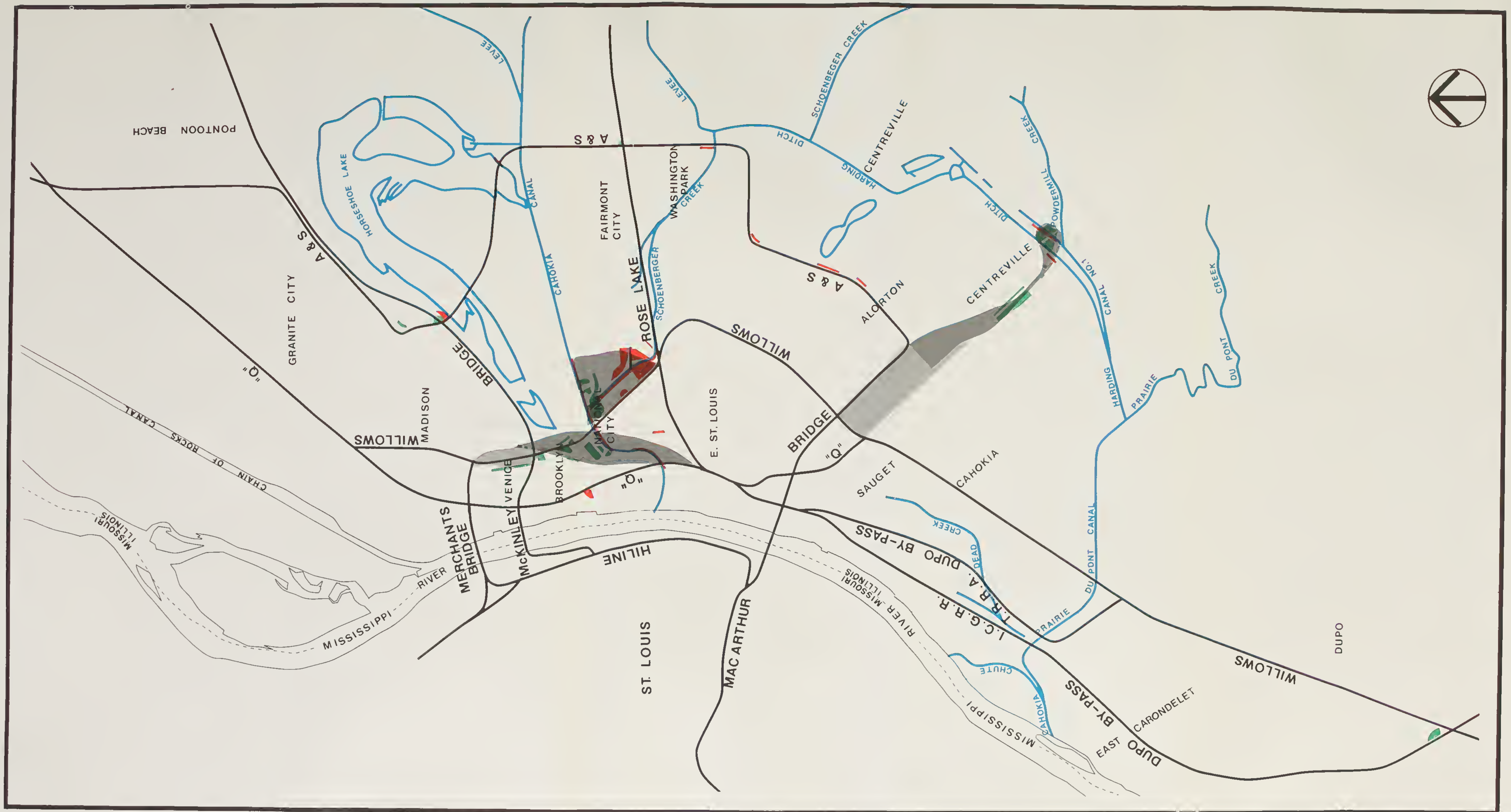
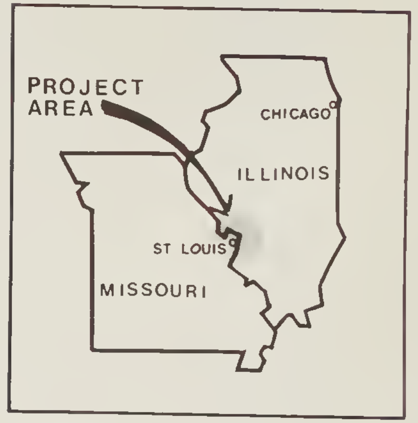


EXHIBIT E

AFFECTED NATURAL ENVIRONMENTS



VICINITY MAP

LEGEND

- RAILROAD TRACKS
- WATERWAYS
- PRIME FARMLAND
- SENSITIVE HABITAT
- EXISTING RAILROAD YARDS
- PROPOSED RAILROAD YARDS

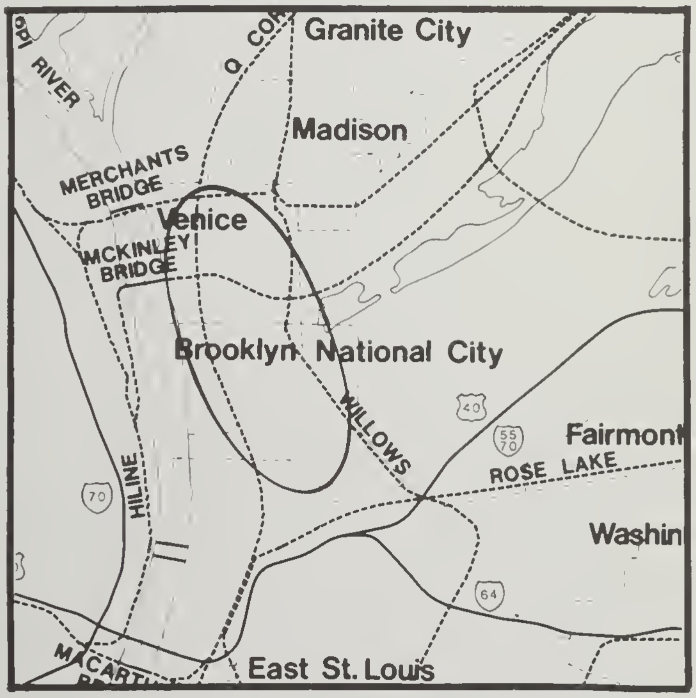
6000 3000 0 5700

SCALE IN FEET

ST. LOUIS MARGE PROJECT
SVERDRUP / ENVIRODYNE / KNIGHT

EXHIBIT F - 1

ROUTE 3 RELOCATION ALTERNATIVE NO. 1



VICINITY MAP

LEGEND

PROPOSED ROUTE 3
EXISTING ROUTE 3
RAILROAD CORRIDOR
NEW YARD R.O.W.
ROUTE 3 R.O.W.
67 dBA Leq (1hour) MAX.

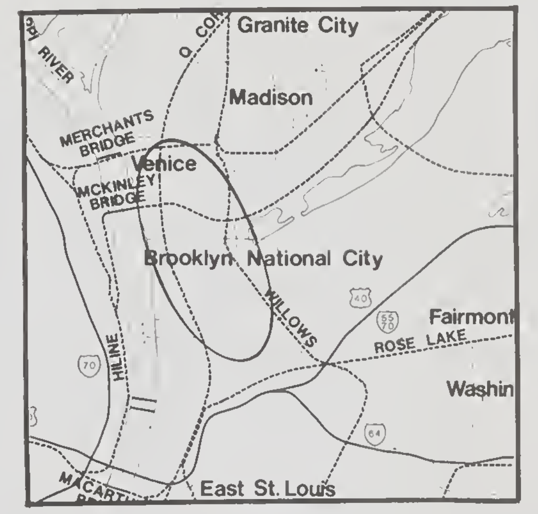
400 200 0 400

SCALE IN FEET

ST. LOUIS MARGE PROJECT
SVERDRUP / ENVIRODYNE / KNIGHT

EXHIBIT F - 1

ROUTE 3 RELOCATION ALTERNATIVE NO. 1



VICINITY MAP

LEGEND

PROPOSED ROUTE 3	
EXISTING ROUTE 3	
RAILROAD CORRIDOR	
NEW YARD R.O.W.	
ROUTE 3 R.O.W.	
67 dBA Leq (1hour) MAX.	

400 200 0 400

SCALE IN FEET

ST. LOUIS MARGE PROJECT
SVERDRUP / ENVIRODYNE / KNIGHT

EXHIBIT F - 2

ROUTE 3 RELOCATION ALTERNATIVE NO. 2

VICINITY MAP

LEGEND

PROPOSED ROUTE 3	
EXISTING ROUTE 3	
RAILROAD CORRIDOR	
NEW YARD R.O.W.	
ROUTE 3 R.O.W.	
67 dBA Leq (1 hour) MAX.	

400 200 0 400

SCALE IN FEET

ST. LOUIS MARGE PROJECT
SVERDRUP / ENVIRODYNE / KNIGHT

EXHIBIT F-2

ROUTE 3 RELOCATION ALTERNATIVE NO. 2

VICINITY MAP

LEGEND

- PROPOSED ROUTE 3
- EXISTING ROUTE 3
- RAILROAD CORRIDOR
- NEW YARD R.O.W.
- ROUTE 3 R.O.W.
- 67 dBA Leq (1 hour) MAX.

400 200 0 400

SCALE IN FEET

ST. LOUIS MARGE PROJECT
SVERDRUP/ENVIRODYNE/KNIGHT

EXHIBIT G

ROUTE 3 RELOCATION ALTERNATIVE NO. 3

VICINITY MAP

LEGEND

PROPOSED ROUTE 3	
EXISTING ROUTE 3	
RAILROAD CORRIDOR	
NEW YARD R.O.W.	
ROUTE 3 R.O.W.	
67dBA Leq (1hour) MAX.	

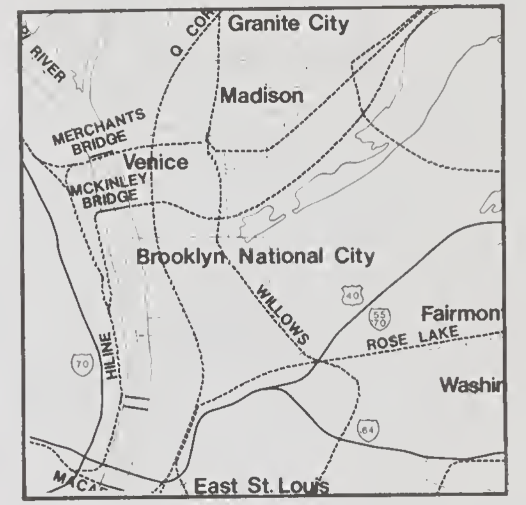
400 200 0 400

SCALE IN FEET

ST. LOUIS MARGE PROJECT
SVERDRUP ENVIRODYNE KNIGHT

EXHIBIT G

ROUTE 3 RELOCATION ALTERNATIVE NO. 3



VICINITY MAP

LEGEND

PROPOSED ROUTE 3	
EXISTING ROUTE 3	
RAILROAD CORRIDOR	
NEW YARD R.O.W.	
ROUTE 3 R.O.W.	
67dBA Leq (1hour) MAX.	

400 200 0 400

SCALE IN FEET

ST. LOUIS MARGE PROJECT
SVERDRUP ENVIRODYNE KNIGHT

EXHIBIT H

LAND USE

VICINITY MAP

LEGEND

RESIDENTIAL
COMMERCIAL
INDUSTRIAL
RAIL CONCENTRATION
VACANT/AGRICULTURAL
RECREATIONAL USE
UNCLASSIFIED
EXISTING RAILROAD YARDS
PROPOSED RAILROAD YARDS

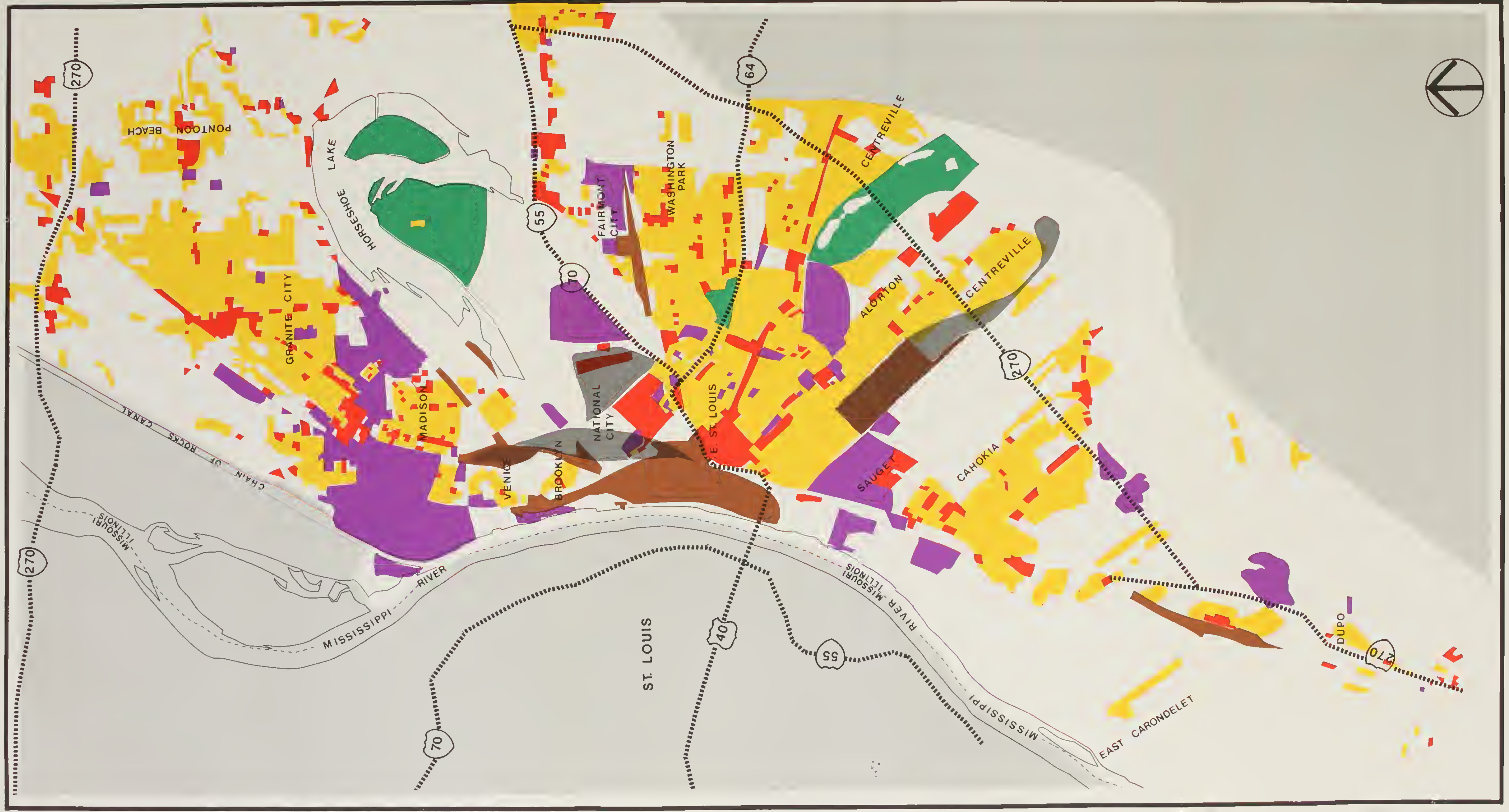
6000 3000 0 5700

SCALE IN FEET

ST. LOUIS MARGE PROJECT
SVERDRUP/ENVIRODYNE/KNIGHT

EXHIBIT H

LAND USE



VICINITY MAP

LEGEND

- RESIDENTIAL
- COMMERCIAL
- INDUSTRIAL
- RAIL CONCENTRATION
- VACANT/AGRICULTURAL
- RECREATIONAL USE
- UNCLASSIFIED
- EXISTING RAILROAD YARDS
- PROPOSED RAILROAD YARDS

6000 3000 0 5700

SCALE IN FEET

ST. LOUIS MARGE PROJECT
SVERDRUP/ENVIRODYNE/KNIGHT

EXHIBIT I

CENSUS TRACTS (1970)

VICINITY MAP

LEGEND

EXISTING RAILROAD YARD

PROPOSED RAILROAD YARD

CENSUS TRACTS ....

TRACT NUMBER 0000.00

6000 3000 0 5700

SCALE IN FEET

ST. LOUIS MARGE PROJECT
SVERDRUP/ENVIRODYNE/KNIGHT

EXHIBIT I

CENSUS TRACTS (1970)

VICINITY MAP

LEGEND

EXISTING RAILROAD YARD	
PROPOSED RAILROAD YARD	
CENSUS TRACTS	....
TRACT NUMBER	0000.00

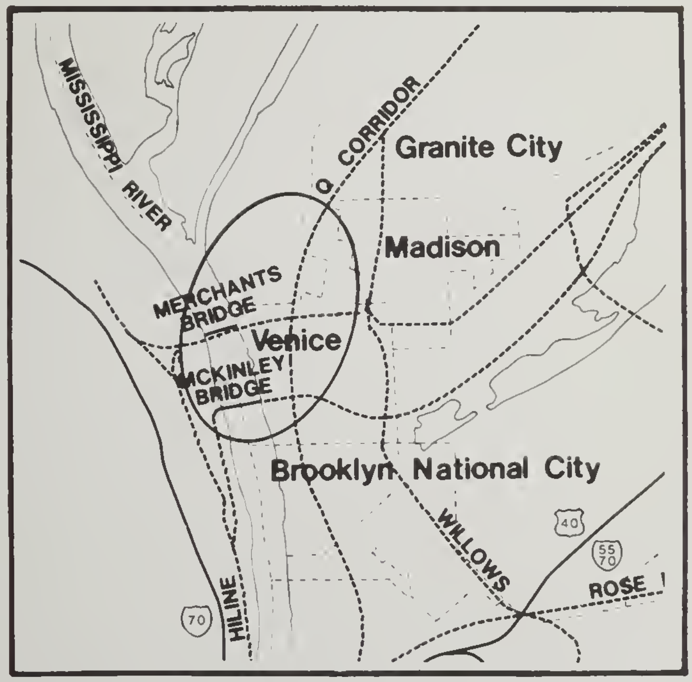
6000 3000 0 5700

SCALE IN FEET

ST. LOUIS MARGE PROJECT
SVERDRUP/ENVIRODYNE/KNIGHT

EXHIBIT J

VENICE / LEE PARK



VICINITY MAP

LEGEND

PROPOSED ALTERNATIVE SITES TO RELOCATE LEE PARK SOFTBALL / BASEBALL DIAMONDS	*
CITY LIMIT LINE	– – – – –
PROPOSED R.O.W.	—— – ——
PROPOSED RAILROAD CONNECTION	–·–·–·–
EXISTING RAIL CORRIDOR	————

540 270 0 540

SCALE IN FEET

ST. LOUIS MARGE PROJECT
SVERDRUP / ENVIRODYNE / KNIGHT

EXHIBIT J

VENICE LEE PARK

VICINITY MAP

LEGEND

PROPOSED ALTERNATIVE SITES TO RELOCATE LEE PARK SOFTBALL BASEBALL DIAMONDS	*
CITY LIMIT LINE	- - - - -
PROPOSED R.O.W.	—- - —
PROPOSED RAILROAD CONNECTION	-·-·-·
EXISTING RAIL CORRIDOR	———

540 270 0 540

SCALE IN FEET

ST. LOUIS MARGE PROJECT
SVERDRUP/ENVIRODYNE/KNIGHT

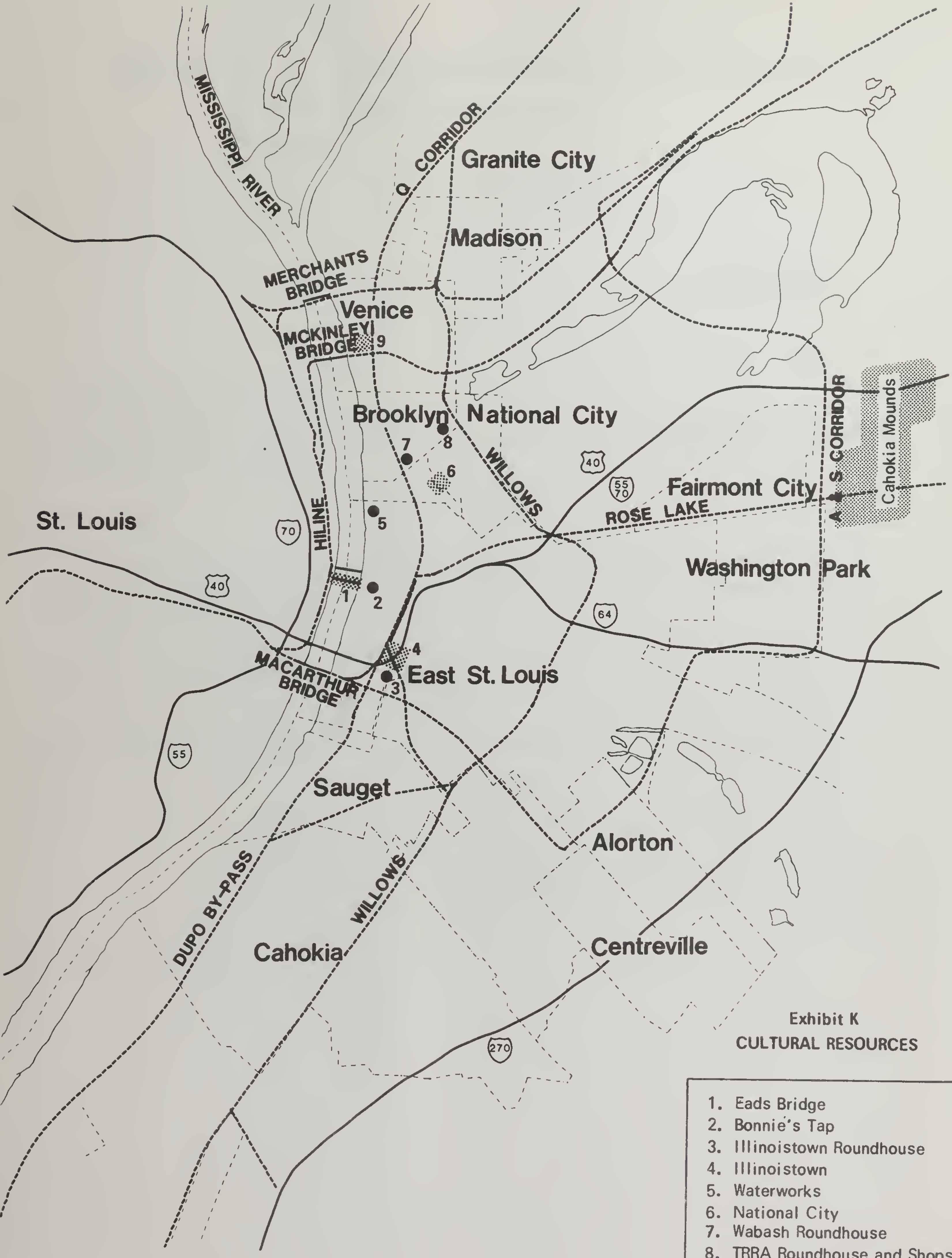


Exhibit K
CULTURAL RESOURCES

1. Eads Bridge
2. Bonnie's Tap
3. Illinoistown Roundhouse
4. Illinoistown
5. Waterworks
6. National City
7. Wabash Roundhouse
8. TRRA Roundhouse and Shops
9. Kerr Island

Illinois Department of Conservation
life and land together
605 WM. G. STRATTON BUILDING • 400 SOUTH SPRING STREET • SPRINGFIELD 62706
CHICAGO OFFICE – ROOM 100, 160 NO. LASALLE 60601
David Kenney, Director • James C. Helfrich, Assistant Director

July 2, 1981

RECEIVED
JUL 8 1981
MANAGEMENT & SPECIAL STUDIES

Mr. Merrill L. Travis, Chief
Management & Special Studies
Illinois Department of Transportation
2300 South Dirksen Parkway
Springfield, Illinois 62764

Dear Mr. Travis:

We have reviewed the St. Louis Metro Area Rail Gateway Enterprise in relation to the Eads Bridge. This structure was declared a National Historic Landmark on January 2, 1974.

We concur with your finding that the project as proposed will have no effect on this National Register structure.

Please retain this letter in your files as evidence of compliance with section 106 of the National Historic Preservation Act of 1966, as amended.

Sincerely,

David Kenney

David Kenney
State Historic Preservation
Officer

DK:AEM:nr